MITSUBISHI

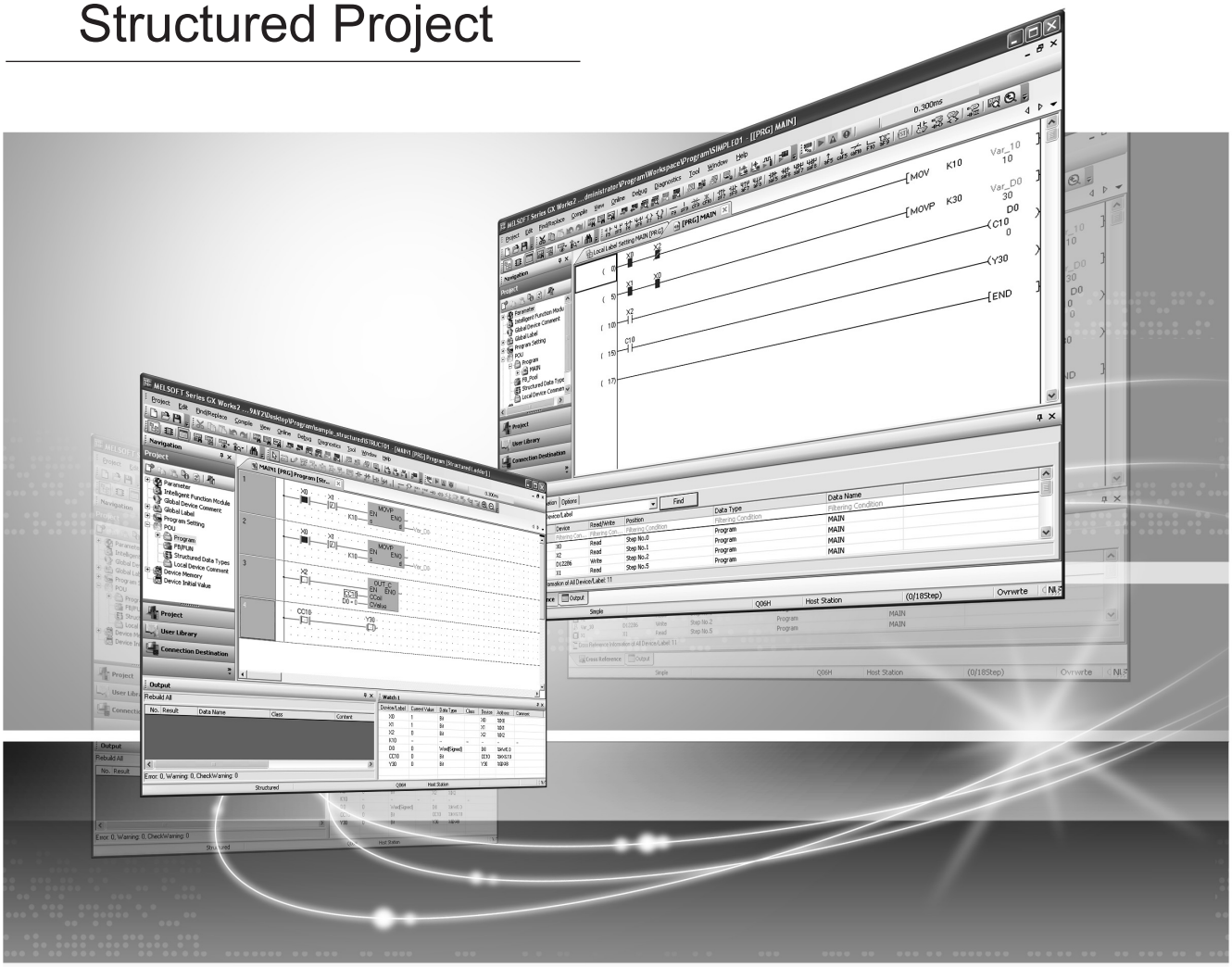
MELSOFT

Integrated FA Software

GX Works2 Version 1

Operating Manual

Structured Project



MELSOFT
Integrated FA Software

SW1DNC-GXW2-E

● SAFETY PRECAUTIONS ●

(Always read these instructions before using this product.)

Before using this product, thoroughly read this manual and the relevant manuals introduced in this manual and pay careful attention to safety and handle the products properly.
The precautions given in this manual are concerned with this product. For the safety precautions of the programmable controller system, refer to the User's Manual for the CPU module.

In this manual, the safety precautions are ranked as "⚠WARNING" and "⚠CAUTION".

⚠ WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠ CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Note that the ⚠CAUTION level may lead to serious consequences according to the circumstances. Always follow the precautions of both levels because they are important for personal safety.

Please save this manual to make it accessible when required and always forward it to the end user.

[Design Instructions]

⚠ WARNING

- **When data change, program change, or status control is performed from a personal computer to a running programmable controller, create an interlock circuit outside the programmable controller to ensure that the whole system always operates safely.**
  Furthermore, for the online operations performed from a personal computer to a programmable controller CPU, the corrective actions against a communication error due to such as a cable connection fault should be predetermined as a system.

[Startup/Maintenance Instructions]

⚠CAUTION

- **The online operations performed from a personal computer to a running programmable controller CPU (Program change when a programmable controller CPU is RUN, operating status changes such as forced input/output operation and RUN-STOP switching, and remote control operation) must be executed after the manual has been carefully read and the safety has been ensured.**
  When changing a program while a programmable controller CPU is RUN, it may cause a program corruption in some operating conditions. Fully understand the precautions described in GX Works2 Version 1 Operating Manual (Common) before use.
- **The positioning test functions of OPR, JOG, inching or positioning data for QD75/LD75 positioning module must be executed with the programmable controller set to STOP after the manual has been carefully read and the safety has been ensured. Specially when executing the function on the network system, ensure the safety thoroughly since the machinery whose operation cannot be checked by an operator may be activated. The operation failure may cause the injury or machine damage.**

●CONDITIONS OF USE FOR THE PRODUCT●

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

REVISIONS

The manual number is written at the bottom left of the back cover.

Print date	Manual number	Revision
Jul., 2008	SH(NA)-080781ENG-A	First edition
Jan., 2009	SH(NA)-080781ENG-B	Model Addition Q00UJ, Q00U, Q01U, Q10UDH, Q10UDEH, Q20UDH, Q20UDEH, FX series Addition MANUALS, Section 6.2.7, Appendix 1.4 Correction GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.1, Section 1.3.1, Section 1.3.5, Section 1.3.6, Section 4.2, Section 5.3, Section 5.4, Section 5.7, Section 6.1.1, Section 6.2.1, Section 6.2.2, Section 6.2.8, Section 7.1, Section 7.2, Section 7.5, Section 7.5.1, Section 7.6.5, Section 8.1, Section 9.4, Section 9.5, Section 11.2, Appendix 1.1, Appendix 1.5
Jul., 2009	SH(NA)-080781ENG-C	Model Addition Q00J, Q00, Q01 Addition Section 6.4.3, Chapter 7 Correction MANUALS, GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.2, Section 1.3, Section 2.1, Section 4.1, Section 4.2.1, Section 4.2.2, Section 4.2.3, Section 4.3.1, Section 4.3.2, Section 4.4.1, Section 5.1, Section 5.2, Section 5.3, Section 5.4, Section 5.6.1, Section 6.1, Section 6.2.1, Section 6.2.3, Section 6.2.4, Section 6.3, Section 6.3.1, Section 6.4, Section 6.4.4, Section 6.4.10, Section 6.4.11, Section 6.4.13, Chapter 8, Section 9.1, Section 11.2, Section 11.3, Section 12.2, Appendix 1 Section 6.3.4 is changed to Section 7.12. Section 6.4.3 to Section 6.4.12 are changed to Section 6.4.4 to Section 6.4.13 Chapter 7 to Chapter 11 are changed to Chapter 8 to Chapter 12
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Jan., 2010	SH(NA)-080781ENG-E	Model Addition L02, L26-BT Addition CONDITIONS OF USE FOR THE PRODUCT, Section 6.2.11 Correction MANUALS, GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL, Section 1.3, Section 2.1, Section 4.1, Section 4.2.3, Section 4.4.1, Section 5.2, Section 5.7, Section 6.2.2, Section 6.4.2, Section 6.4.3, Section 6.4.7, Section 6.4.13, Section 8.1, Section 8.2, Section 8.4.7, Section 9.1, Section 12.1, Section 12.2, Appendix 1 Section 6.2.11 is changed to Section 6.2.12.

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Sep., 2011	SH(NA)-080781ENG-K	Correction Section 1.3.1

Japanese Manual Version SH-080732-P

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INTRODUCTION

Thank you for purchasing the Mitsubishi integrated FA software, MELSOFT series.
Before using this product, thoroughly read this manual to develop full familiarity with the functions and performance to ensure correct use.

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■ MANUALS

Related manuals are separately issued according to the purpose of their functions in GX Works2.

● Related manuals

The manuals related to this product are shown below.
Refer to the following tables when ordering required manuals.

1) Operation of GX Works2

Manual name	Manual number (Model code)
GX Works2 Version 1 Operating Manual (Common) Explains the system configuration of GX Works2 and the functions common to Simple project and Structured project such as parameter setting, operation method for the online function. (Sold separately)	SH-080779ENG (13JU63)
GX Works2 Version 1 Operating Manual (Simple Project) Explains operation methods such as creating and monitoring programs in Simple project of GX Works2. (Sold separately)	SH-080780ENG (13JU64)
GX Works2 Version 1 Operating Manual (Intelligent Function Module) Explains operation methods of intelligent function module such as parameter setting, monitoring programs, and predefined protocol support function in GX Works2. (Sold separately)	SH-080921ENG (13JU69)
GX Works2 Beginner's Manual (Simple Project) Explains fundamental operation methods such as creating, editing, and monitoring programs in Simple project for users inexperienced with GX Works2 (Sold separately)	SH-080787ENG (13JZ22)
GX Works2 Beginner's Manual (Structured Project) Explains fundamental operation methods such as creating, editing, and monitoring programs in Structured project for users inexperienced with GX Works2. (Sold separately)	SH-080788ENG (13JZ23)

2) Structured Programming

Manual name	Manual number (Model code)
MELSEC-Q/L/F Structured Programming Manual (Fundamentals) Explains the programming methods, types of programming languages, and other information required to create structured programs. (Sold separately)	SH-080782ENG (13JW06)
MELSEC-Q/L Structured Programming Manual (Common Instructions) Explains the specifications and functions of common instructions such as sequence instructions, basic instructions, and application instructions that can be used in structured programs. (Sold separately)	SH-080783ENG (13JW07)
MELSEC-Q/L Structured Programming Manual (Application Functions) Explains the specifications and functions of application functions that can be used in structured programs. (Sold separately)	SH-080784ENG (13JW08)
MELSEC-Q/L Structured Programming Manual (Special Instructions) Explains the specifications and functions of special instructions such as module dedicated instruction, PID control instruction, and built-in I/O function dedicated instruction, that can be used in structured programs. (Sold separately)	SH-080785ENG (13JW09)
FXCPU Structured Programming Manual (Device & Common) Explains the devices and parameters provided in GX Works2 for structured programming. (Sold separately)	JY997D26001 (09R925)
FXCPU Structured Programming Manual (Basic & Applied Instruction) Explains the sequence instructions provided in GX Works2 for structured programming.(Sold separately)	JY997D34701 (09R926)
FXCPU Structured Programming Manual (Application Functions) Explains the application functions provided in GX Works2 for structured programming. (Sold separately)	JY997D34801 (09R927)

3) Operation of iQ Works

Manual name	Manual number (Model code)
iQ Works Beginner's Manual Explains fundamental operation methods such as managing the system using MELSOFT Navigator and using system labels for users inexperienced with GX Works2. (Sold separately)	SH-080902ENG (13JZ44)

Point

The Operating Manuals are included on the CD-ROM of the software package in a PDF file format. Manuals in printed form are sold separately for single purchase. Order a manual by quoting the manual number (model code) listed in the table above.

● Purpose of this manual

This manual explains the operations for creating sequence programs in Structured project using the functions supported by GX Works2.
Manuals for reference are listed in the following table according to their purpose.
For information such as the contents and number of each manual, refer to the list of 'Related manuals'.

1) Operation of GX Works2

Purpose		GX Works2 Installation Instructions	GX Works2 Beginner's Manual		GX Works2 Version 1 Operating Manual			
			Simple Project	Structured Project	Common	Simple Project	Structured Project	Intelligent Function Module
Installation	Learning the operating environment and installation method	Details						
	Learning a USB driver installation method				Details			
Operation of GX Works2	Learning all functions of GX Works2				Outline			
	Learning the project types and available languages in GX Works2				Outline			
	Learning the basic operations and operating procedures when creating a simple project for the first time		Details					
	Learning the basic operations and operating procedures when creating a structured project for the first time			Details				
	Learning the operations of available functions regardless of project type.				Details			
	Learning the functions and operation methods for programming				Outline	Details	Details	
	Learning data setting methods for intelligent function module							Details

2) Operations in each programming language

For details of instructions used in each programming language, refer to the section 3 on the next page.

Purpose		GX Works2 Beginner's Manual		GX Works2 Version 1 Operating Manual	
		Simple Project	Structured Project	Simple Project	Structured Project
Simple Project	Ladder				
	SFC	*1			
	ST				
Structured Project	Ladder				
	SFC	*1			
	Structured ladder/ FBD				
	ST				

*1: MELSAP3 and FX series SFC only

3) Details of instructions in each programming language (for QCPU (Q mode)/LCPU)

Purpose		MELSEC-Q/L/F Structured Programming Manual	MELSEC-Q/L Structured Programming Manual			MELSEC-Q/L Programming Manual	MELSEC-Q/L/QnA Programming Manual		Manual for module to be used
		Fundamentals	Common Instructions	Special Instructions	Application Functions	Common Instructions	PID Control Instructions	SFC	-
All languages	Learning details of programmable controller CPU error codes, special relays, and special registers					Details			
Using ladder language	Learning the types and details of common instructions					Details			
	Learning the types and details of instructions for intelligent function modules								Details
	Learning the types and details of instructions for network modules								Details
	Learning the types and details of instructions for the PID control function						Details		
Using SFC language	Learning details of specifications, functions, and instructions of SFC (MELSAP3)							Details	
Using structured ladder/FBD or ST language	Learning the fundamentals for creating a Structured program	Details							
	Learning the types and details of common instructions		Details						
	Learning the types and details of instructions for intelligent function modules			Outline					Details
	Learning the types and details of instructions for network modules			Outline					Details
	Learning the types and details of instructions for the PID control function			Outline			Details		
	Learning the types and details of application functions				Details				

4) Details of instructions in each programming language (for FXCPU)

Purpose		MELSEC-Q/L/F Structured Programming Manual	FXCPU Structured Programming Manual			FXCPU Programming Manual		
		Fundamentals	Device & Common	Basic & Applied Instruction	Application Functions	FX0, FX0S, FX0N, FX1, FXU, FX2C	FX1S, FX1N, FX2N, FX1NC, FX2NC	FX3G, FX3U, FX3UC
Using ladder language	Learning the types and details of basic/ application instructions, descriptions of devices and parameters					Details	Details	Details
Using SFC language	Learning details of specifications, functions, and instructions of SFC					Details	Details	Details
Using structured ladder/FBD or ST language	Learning the fundamentals for creating a structured program	Details						
	Learning the descriptions of devices, parameters, and error codes		Details					
	Learning the types and details of sequence instructions			Details				
	Learning the types and details of application instructions				Details			

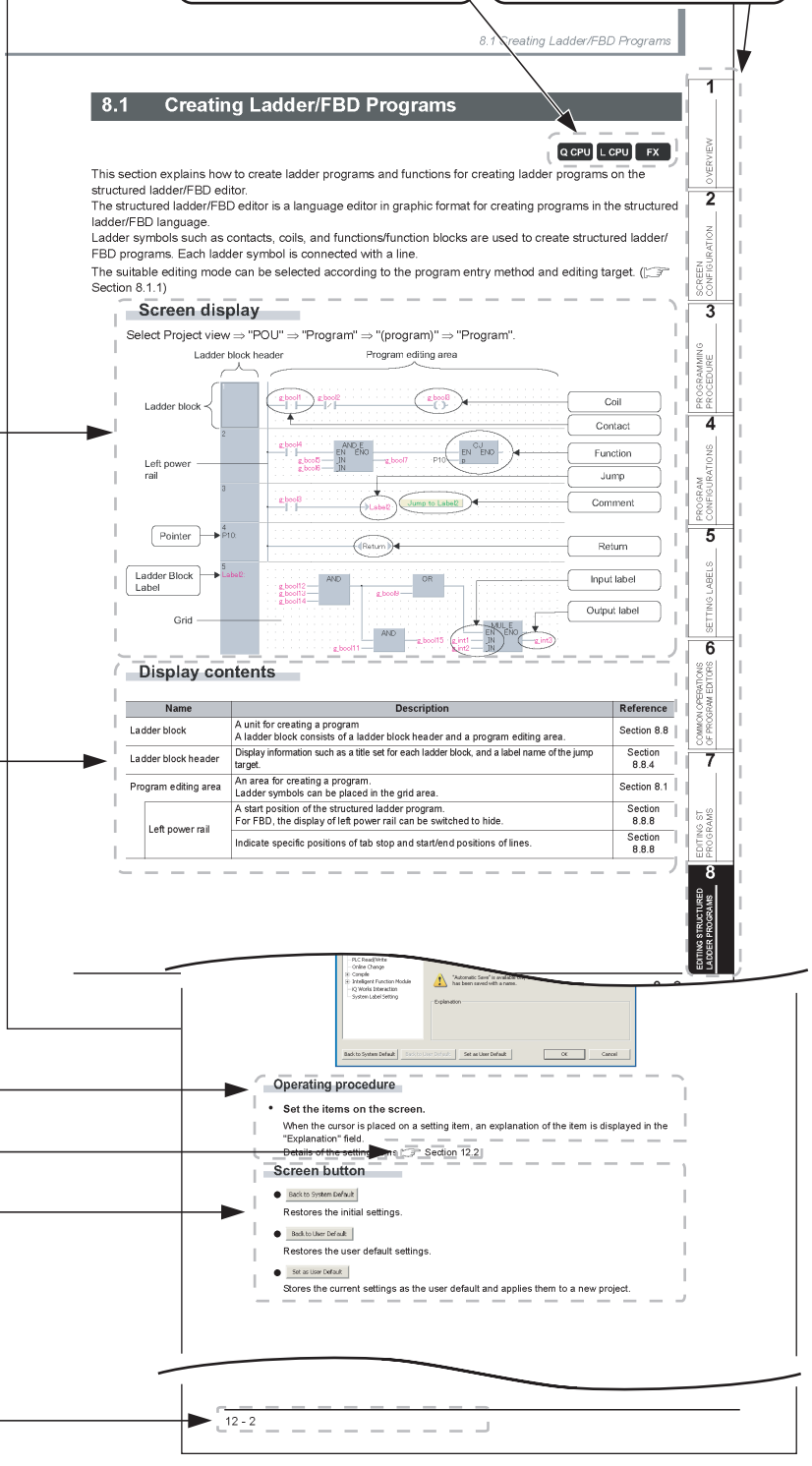
● How to read this manual

Supported CPU

Supported programmable controller CPUs are shown in icons under the section title.

Chapter heading

Index on the right of the page number clarifies the chapter of currently open page.


8.1 Creating Ladder/FBD Programs
8.1 Creating Ladder/FBD Programs
Q CPU
L CPU
FX
This section explains how to create ladder programs and functions for creating ladder programs on the structured ladder/FBD editor.
The structured ladder/FBD editor is a language editor in graphic format for creating programs in the structured ladder/FBD language.
Ladder symbols such as contacts, coils, and functions/function blocks are used to create structured ladder/FBD programs. Each ladder symbol is connected with a line.
The suitable editing mode can be selected according to the program entry method and editing target. (Section 8.1.1)
Screen display
Select Project view ⇒ "POU" ⇒ "Program" ⇒ "(program)" ⇒ "Program".
Ladder block header
Program editing area
Ladder block
Left power rail
Pointer
Ladder Block Label
Grid
Coil
Contact
Function
Jump
Comment
Return
Input label
Output label
Display contents
Name
Description
Reference
Ladder block
A unit for creating a program
A ladder block consists of a ladder block header and a program editing area.
Section 8.8
Ladder block header
Display information such as a title set for each ladder block, and a label name of the jump target.
Section 8.8.4
Program editing area
An area for creating a program.
Ladder symbols can be placed in the grid area.
Section 8.1
Left power rail
A start position of the structured ladder program.
For FBD, the display of left power rail can be switched to hide.
Section 8.8.8
Indicate specific positions of tab stop and start/end positions of lines.
Section 8.8.8
1 OVERVIEW
2 SCREEN CONFIGURATION
3 PROGRAMMING PROCEDURE
4 PROGRAM CONFIGURATIONS
5 SETTING LABELS
6 COMMON OPERATIONS OF PROGRAM EDITORS
7 EDITING ST PROGRAMS
8 EDITING STRUCTURED LADDER/FBD PROGRAMS

Screen display

Describes the screen display procedure.
Follow the and select [(menu)] to open the screen.
*Screen display may depend on the CPU.
In that case, typical example is described.

Display contents

Describes the display contents in the screen.

Operating procedure
Set the items on the screen.
When the cursor is placed on a setting item, an explanation of the item is displayed in the "Explanation" field.
Details of the setting items Section 12.2
Screen button
Back to System Default
Restores the initial settings.
Back to User Default
Restores the user default settings.
Set as User Default
Stores the current settings as the user default and applies them to a new project.
12 - 2

Operating procedure

Describes the operating procedure of the function.

Reference location

leads to the reference location and reference manual.

Screen button

Describes the buttons in the screen.

Section title

Clarifies the section of currently open page.

The following table explains the CPU module icons that indicate the function availability.

Icon			Description
QCPU (Q mode)	LCPU	FXCPU	
Q CPU	L CPU	FX	Normal icons indicate that the corresponding function is available.
*1 Q CPU	-	-	Icons with * (asterisk) symbol indicate that the corresponding function is available with restrictions such as CPU types.
Q CPU	L CPU	FX	Icons with × symbol indicate that the corresponding function is not available.

This manual also uses the following columns:

Point

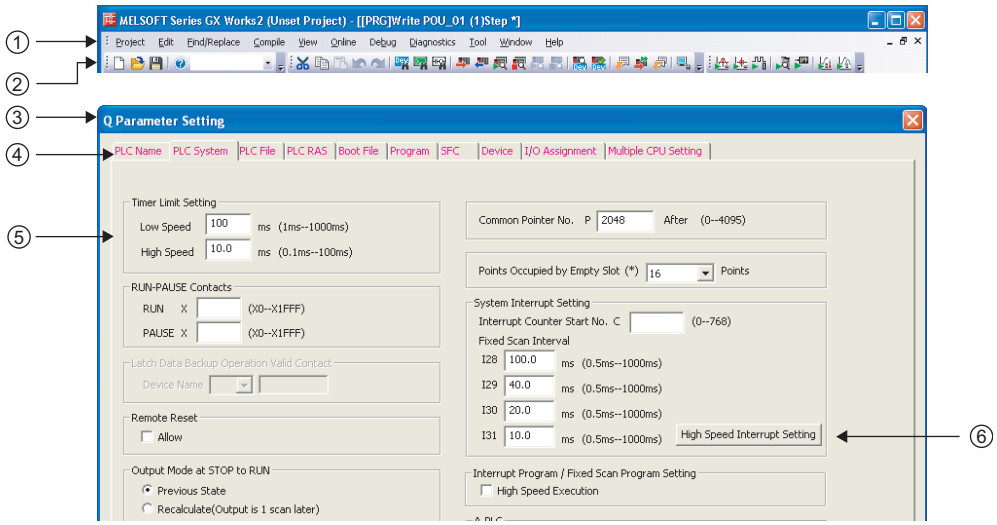
This explains notes for requiring attention or useful functions relating to the information given on the same page.

Restrictions

This explains restrictions relating to the information given on the same page.

● Symbols used in this manual

The following shows the symbols used in this manual with descriptions and examples.


①
②
③
④
⑤
⑥
MELSOFT Series GX Works2 (Unset Project) - [[PRG]Write POU_01 (1)Step *]
Project Edit Find/Replace Compile View Online Debug Diagnostics Tool Window Help
Q Parameter Setting
PLC Name PLC System PLC File PLC RAS Boot File Program SFC Device I/O Assignment Multiple CPU Setting
Timer Limit Setting
Low Speed 100 ms (1ms--1000ms)
High Speed 10.0 ms (0.1ms--100ms)
RUN-PAUSE Contacts
RUN X (X0--X1FFF)
PAUSE X (X0--X1FFF)
Latch Data Backup Operation Valid Contact
Device Name
Remote Reset
Allow
Output Mode at STOP to RUN
Previous State
Recalculate(Output is 1 scan later)
Common Pointer No. P 2048 After (0--4095)
Points Occupied by Empty Slot (*) 16 Points
System Interrupt Setting
Interrupt Counter Start No. C (0--768)
Fixed Scan Interval
I28 100.0 ms (0.5ms--1000ms)
I29 40.0 ms (0.5ms--1000ms)
I30 20.0 ms (0.5ms--1000ms)
I31 10.0 ms (0.5ms--1000ms)
High Speed Interrupt Setting
Interrupt Program / Fixed Scan Program Setting
High Speed Execution

No.	Symbol	Description	Example
①	[ ]	Menu name on a menu bar	[Project]
②		Toolbar icon	
③	(Underline)	Screen name	Q Parameter Setting screen
④	《 》	Tab name in a screen	<<PLC System>>
⑤	" "	Item name in a screen	"Timer Limit Setting"
⑥		Button on a screen	button
–		Keyboard key	Ctrl

■ GENERIC TERMS AND ABBREVIATIONS IN THIS MANUAL

This manual uses the generic terms and abbreviations listed in the following table to discuss the software packages and programmable controller CPUs. Corresponding module models are also listed if needed.

Generic term and abbreviation		Description
GX Works2		Generic product name for SWnDNC-GXW2-E (n: version)
Existing application		-
	GX Developer	Generic product name for SWnD5C-GPPW-E, SWnD5C-GPPW-EA, SWnD5C-GPPW-EV, and SWnD5C-GPPW-EVA (n: version)
	GX IEC Developer	Generic product name for SWnD5C-MEDOC3 (n: version)
MELSOFT Navigator		Product name for the integrated development environment included in SWnDNC-IQWK (iQ Platform compatible engineering environment MELSOFT iQ Works) (n: version)
iQ Works		Abbreviation for iQ platform supporting engineering environment MELSOFT iQ Works
Personal computer		Generic term for personal computer on which Windows® operates
Basic model QCPU		Generic term for Q00J, Q00, and Q01
High Performance model QCPU		Generic term for Q02, Q02H, Q06H, Q12H, and Q25H
Universal model QCPU		Generic term for Q00UJ, Q00U, Q01U, Q02U, Q03UD, Q03UDE, Q04UDH, Q04UDEH, Q06UDH, Q06UDEH, Q10UDH, Q10UDEH, Q13UDH, Q13UDEH, Q20UDH, Q20UDEH, Q26UDH, Q26UDEH, Q50UDEH, and Q100UDEH
QCPU (Q mode)		Generic term for Basic model QCPU, High Performance model QCPU, and Universal model QCPU
LCPU		Generic term for L02, L02-P, L26-BT, and L26-PBT
FXCPU		Generic term for FX0, FX0S, FX0N, FX1, FXU, FX2C, FX1S, FX1N, FX1NC, FX2N, FX2NC, FX3G, FX3U, and FX3UC
FXGP(WIN)		Abbreviation for SW0PC-FXGP/WIN-E
MELSAP3		Abbreviation for the SFC function in MELSAP3 display format
MELSAP-L		Generic term for the SFC function in MELSAP-L (instruction format) and MELSAP-L (start conditions format)
SFC		Generic term for MELSAP3, MELSAP-L, and FX series SFC

■ TERMS

The following are the terms used in this manual.

Term	Description
Simple project	Generic term for projects created by using the ladder/SFC/ST language
Structured project	Generic term for projects created by using the ladder/SFC/ST/structured ladder/FBD language
Common instruction	Generic term for sequence instructions, basic instructions, application instructions, data link instructions, multiple CPU dedicated instructions, and multiple CPU high-speed transmission dedicated instructions
Special instruction	Generic term for module dedicated instructions, PID control instructions, socket communication function instructions, built-in I/O function instructions, and data logging function instructions
List format	An input format to input mnemonic language in a ladder program

MEMO

1 OVERVIEW

This manual explains specific operating procedures using Structured project.
For the full product features and functions of GX Works2, refer to the following manual.
☞GX Works2 Version 1 Operating Manual (Common)

1.1 What is Structured Project? 1-2
1.2 Features of Structured Project. 1-2
1.3 List of Functions 1-5

1.1 What is Structured Project?

In Structured project, programs can be created using the structured programming.
By segmenting the control functions and creating components from commonly used parts of programs, this type of programming (structured programming) is easy to understand visually, and created components are highly reusable to other programs.

1.2 Features of Structured Project

This section explains the features of Structured project.

■ Various programming languages are available

Various programming languages are available for structured programs. Users can combine these languages by selecting the most appropriate programming language for each purpose to create programs.

Table 1.2-1 Programming languages supported by Structured project

Type		Name	Description
Ladder*1		Ladder diagram	A graphic language using ladders composed of contacts and coils. Can be operated in a similar way to existing GX Developer operation.
ST		Structured text	A high-level structured text language with grammatical structure similar to C language.
SFC*1		Sequential function chart	A graphic language in which executing orders and executing conditions of programs are defined.
Structured ladder		Ladder diagram	A graphic language using ladders composed of contacts and coils, which can be inserted flexibly.
	FBD	Function block diagram	A graphic language using ladders by connecting functions and/or function blocks with lines.

*1: Not supported by FXCPU.

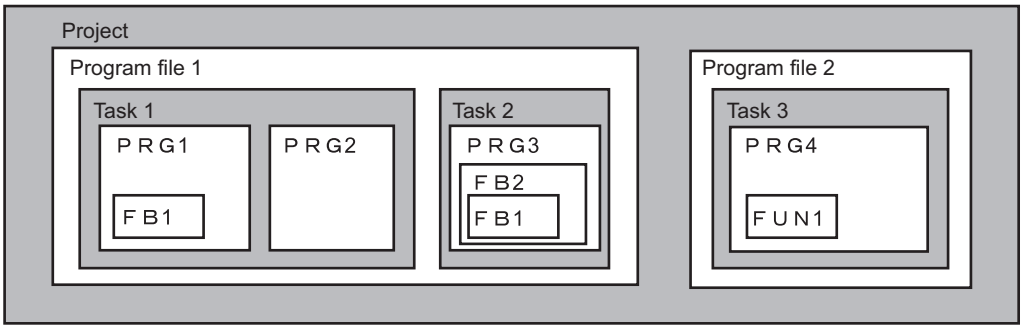
■ Common program editors for each programmable controller CPU

The program editors of Structured project can be used for any type of programmable controller CPU supported by GX Works2. Users can select the desired programming languages regardless of the target programmable controller CPU.

For details of the programmable controller CPUs supported by GX Works2, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Common)

■ Creating large programs efficiently with structured programming

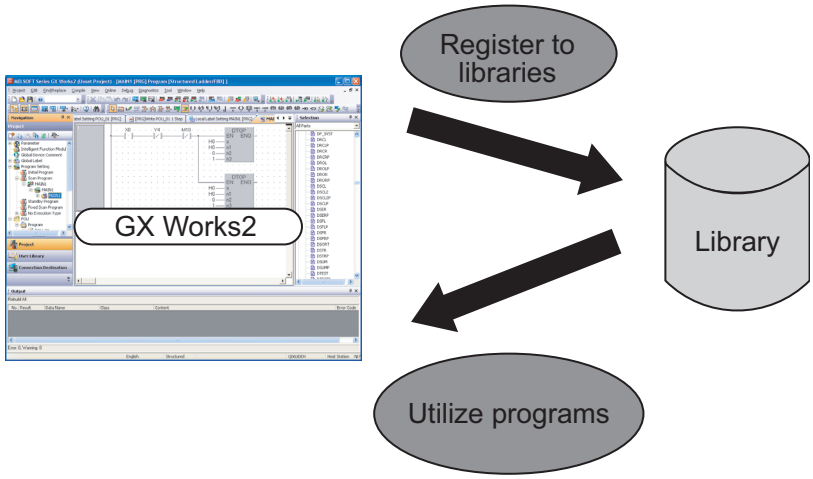
In Structured project, programs can be easily structured by managing program components in a hierarchy.*1
Programs that are easy to maintain and highly reusable can be created efficiently by structuring programs. This is suitable for developing large programs.



*1 : A program is created in units of POUs (abbreviation for Program Organization Units) such as program blocks (PRGs), functions (FUNs), and function blocks (FBs). Function blocks can be nested in a hierarchy. Created programs are registered to the tasks of program files.

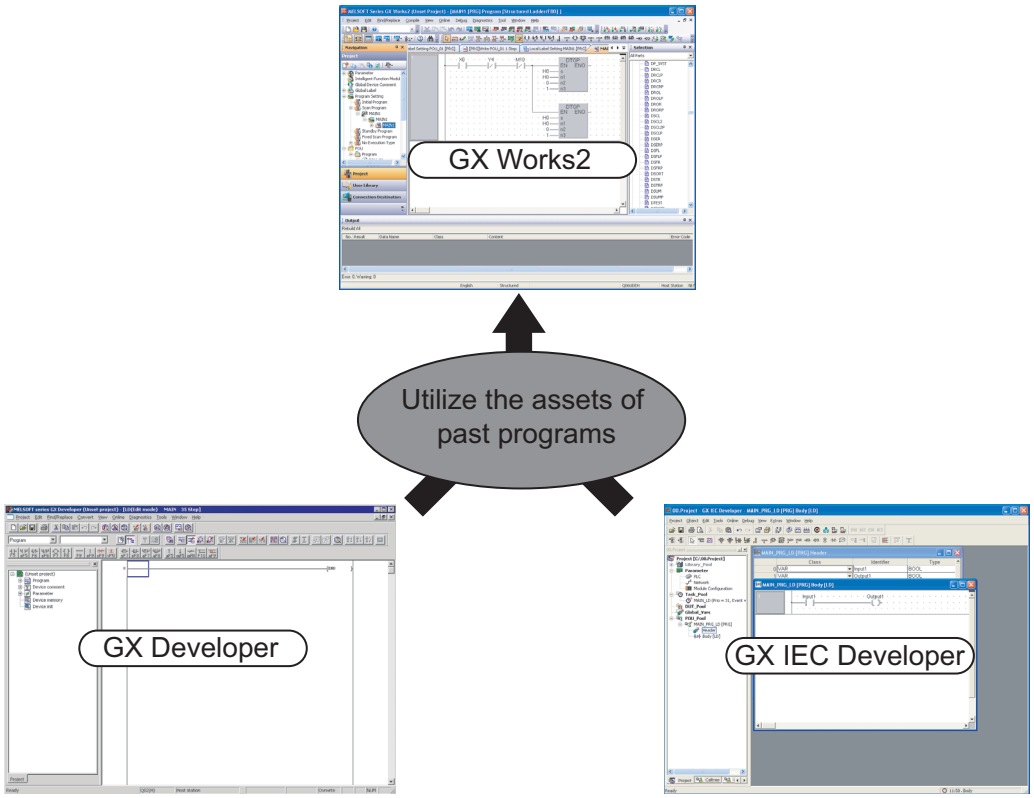
■ Assets of programs are utilized as libraries

In Structured project, sequence program components can be saved as libraries which can be utilized as assets of programs in multiple projects.



■ Assets of past programs can be utilized

In GX Works2, sequence programs created with previous versions of GX Developer and GX IEC Developer can be imported, which enables efficient utilization of program assets.



1.3 List of Functions

This section shows the list of functions of GX Works2.
The functions are divided into common functions available (Project, Online, Debug, Diagnostics, Tool, Window, and Help) and functions used for each editing and setting target (Edit, Find/Replace, Compile, and View).
For (Common), (Simple), and (Intelligent) indicated in the Reference column, refer to the following manuals respectively:
(Common) ..... GX Works2 Version 1 Operating Manual (Common)
(Simple) ..... GX Works2 Version 1 Operating Manual (Simple Project)
(Intelligent) ..... GX Works2 Version 1 Operating Manual (Intelligent Function Module)

1.3.1 List of functions common to Simple project and Structured project

This section explains the functions common to Simple project and Structured project.

■ List of common functions

The following tables show functions that are available regardless of the type of editing or setting target.

Project (common function)			Reference
New		Create a new project.	(Common)
Open		Open an existing project.	
Close		Close an open project.	
Save		Save a project.	
Save As		Name and save a project.	
Compress/Unpack			
	Compress	Compress and save a project.	
	Unpack	Unpack a compressed project.	
Delete		Delete an existing project.	
Verify		Verify between two project data.	
Project Revision			-
	Revision Entry	Register the project change history.	(Common)
	Revision List	Display the list of project change history.	
Change PLC Type		Change the programmable controller CPU type.	
Change Project Type		Change the project type from Simple project (without labels) to Simple project (with labels), or from Simple project (with labels) to Structured project.	
Object			-
	New	Add data to a project.	(Common)
	Rename	Rename the selected data.	
	Delete	Delete the selected data.	
	Copy	Copy the selected data.	
	Paste	Paste the copied data.	
	Set as Default Connection	Specify data in selected connection target as a connection target for regular use.	
	Property	Display the selected data properties.	

Project (common function)			Reference
Intelligent Function Module			-
	New Module	Add new intelligent function module data.	(Intelligent)
	Delete Module	Delete intelligent function module data.	
	Property	Display properties of an intelligent function module data.	
	Save the Positioning Module Data	Save data of the positioning module selected on the Project view to a file.	
	Read from the Positioning Module Data	Read data from the positioning module and reflect it to the positioning module selected on the Project view.	
	Intelligent Function Module Parameter List	Display a list of set/unset parameters of an intelligent function module.	
Open Other Data			-
	Open Other Project	Open a project created with GX Developer.	(Common)
	Read ASC Format File	Read an ASC format file.	
	Import GX Configurator-QP Data	Read a project created with GX Configurator-QP.	(Intelligent)
Export to GX Developer Format File		Save an open project in GX Developer format.	(Common)
Library			-
	Create	Create a new library.	Chapter 13
	Install	Import a created library to the project.	
	Deinstall	Delete a library from the project.	
	Reload	Update the library imported to the project.	
	Rename	Rename a library.	
	Open	Enable editing of a library.	
	Close	Disable editing of a library.	
	Change Password	Set a password for a library.	
	Save As	Name and save a project.	
	Save	Save a library file.	
	Help	Display help information of the library.	
Security			-
	Change Password	Change the password of the current login user.	(Common)
	User Management	Manage user information of the project. Add/delete a user or change the user information.	
	Data Security Setting	Set the access authorization of each user related to reading/writing data.	
Print		Batch print multiple data in the project.	
Print Preview		Display a print preview of data to be batch printed.	
Print Window		Print the open screen.	
Print Window Preview		Display the print preview of the open screen.	
Printer Setup		Change the printer settings.	
(Recently used files 1 to 4)		Display the recently used GX Works2 project paths and open the selected project.	
Start GX Developer		Start GX Developer from GX Works2.	
Exit		Exit GX Works2.	

Edit (common function)		Reference
Undo	Restore the previous processing status.	-
Redo	Restore the processing deleted with [Undo].	
Cut	Cut the selected data.	
Copy	Copy the selected data.	
Paste	Paste the cut or copied data at the cursor position.	

Find/Replace (common function)		Reference
Cross Reference	Display the usage of selected device or label.	(Common)
Device List	Display the usage of devices.	
Find Device	Search a device/label in the program.	
Find Instruction	Search an instruction.	
Find Contact or Coil	Search a contact or coil corresponding to the specified device.	
Find String	Search a string.	
Replace Device	Replace a device/label in the program.	
Replace Instruction	Replace an instruction.	
Replace String	Replace a string.	
Change Open/Close Contact	Change an open contact to a closed contact, or change a closed contact to an open contact.	
Device Batch Replace	Batch-replace devices with the specified device.	
Register to Device Batch Replace	Register selected devices on the Device Batch Replace screen.	

Compile (common function)		Reference
Build	Convert/compile a program being edited.	Section 10.1
Online Program Change	Write sequence programs to a programmable controller CPU after the conversion/compilation.	(Common)
Rebuild All	Convert/compile all programs in the project.	Section 10.2

View (common function)			Reference
Toolbar			-
	Toolbar name	Display/hide each toolbar.	(Common)
Statusbar		Display/hide the status bar.	
Color and Font		Set the display color for characters such as labels, device comments on the work window.	
Docking Window			-
	Navigation Window	Display/hide the Navigation window.	(Common)
	Function Block Selection Window	Display/hide the Function Block Selection window. Select a part such as FB or function on the window for utilizing it to a program.	Section 6.2.1
	Output Window	Display/hide the Output window. In the Output window, the conversion (compilation) result is displayed.	Section 10.6
	Cross Reference	Display/hide the Cross Reference window. In the Cross Reference window, devices/labels used in the project are displayed.	(Common)
	Device List	Display/hide the Device List window. In the Device List window, the usage of selected device is displayed.	
	Watch 1 to 4	Display/hide the Watch window. In the Watch window, the monitoring result is displayed.	
	Intelligent Function Module Monitor		-
		Intelligent Function Module Monitor 1 to 10	Display/hide the Intelligent Function Module Monitor window.	(Intelligent)
	Intelligent Function Module Guidance	Display/hide the Intelligent Function Module Guidance window.	
	Find/Replace	Display/hide the Find/Replace window. In the Find/Replace window, the search/replace result is displayed.	(Common)
	Debug Window		-
		Break Point Window	Display/hide the Break Point window.	(Common)
		Break Device Window	Display/hide the Break Device window.	
		Skip Range Window	Display/hide the Skip Range window.	

Online (common function)			Reference
Read from PLC		Read data from the programmable controller CPU.	Section 11.1
Write to PLC		Write data to the programmable controller CPU.	
Verify with PLC		Verify a project being edited against the data in the programmable controller CPU.	(Common)
Remote Operation		Remotely control RUN/PAUSE/STOP of the programmable controller CPU from GX Works2.	
Password/Keyword			-
	New	Set a password/keyword to the programmable controller CPU.	(Common)
	Delete	Cancel the password/keyword set to the programmable controller CPU.	
	Disable	Temporarily unlock the password/keyword set to the programmable controller CPU.	
PLC Memory Operation			-
	Format PLC Memory	Format the programmable controller CPU memory.	(Common)
	Clear PLC Memory	Clear the programmable controller CPU memory.	
	Arrange PLC Memory	Arrange the programmable controller CPU memory.	
Delete PLC Data		Delete data in the programmable controller CPU.	
PLC User Data			-
	Read PLC User Data	Read the programmable controller CPU user data.	(Common)
	Write PLC User Data	Write the programmable controller CPU user data.	
	Delete PLC User Data	Delete the programmable controller CPU user data.	
Export to ROM Format		Copy the program memory data in the programmable controller CPU to ROM.	
Program Memory Batch Download		Transfer the content of program cache memory to program memory in batch.	
Latch Data Backup			-
	Backup	Back up device memory/file register/error history data to the standard ROM.	(Common)
	Delete Backup Data	Delete the backup data in the programmable controller CPU.	
PLC Module Change			-
	Create Backup Data	Back up data in the programmable controller CPU to the memory card.	(Common)
	Restore	Restore the backup data to another programmable controller CPU.	
Set Clock		Set the clock in the programmable controller CPU.	
Register/Cancel Display Module Menu		Register/cancel menus to operate intelligent function module using the LCPU display module menu.	

Online (common function)			Reference
Monitor			-
	Monitor Mode	Switch the mode of the open window to "Monitor Mode" during monitoring.	(Simple)
	Monitor (Write Mode)	Switch the mode of the open window to "Monitor (Write Mode)" during monitoring.	
	Start Monitoring (All Windows)	Start monitoring of all open windows.	(Common)
	Stop Monitoring (All Windows)	Stop monitoring of all open windows.	
	Start Monitoring	Start monitoring of the open window.	Section 12.1
	Stop Monitoring	Stop monitoring of the open window.	
	Change Value Format (Decimal)	Display the current device value in decimal in program monitoring.	Section 12.3.1
	Change Value Format (Hexadecimal)	Display the current device value in hexadecimal in program monitoring.	
	Device/Buffer Memory Batch	Monitor device/buffer memory in batch.	(Common)
	Program List	Monitor the processing time of programs being executed.	
	Interrupt Program List	Monitor the number executions of interrupt programs.	
	Change Instance (Function Block)	Select an instance of the function block to be monitored.	Section 12.2
	SFC All Block Batch Monitoring	Batch monitor all blocks in the SFC program.	(Simple)
	SFC Auto Scroll	Scroll the screen to display active steps automatically when they are out of the screen during monitoring.	
Watch			-
	Start Watching	Start monitoring the current values of registered devices/ labels and intelligent function module.	(Common)
	Stop Watching	Stop monitoring the current values of registered devices/ labels and intelligent function module.	
	Register Watch	Register the selected devices to the Watch window.	
Local Device Batch Read + Save CSV		Read local device data from the programmable controller CPU and saves them to a personal computer in CSV format.	

Debug (common function)			Reference
Start/Stop Simulation		Start/stop simulation.	(Common)
Instructions Unsupported by Simulation		Display a list of the instructions and devices used in the program unsupported by the simulation function.	
Modify Value		For ladder and SFC (Zoom) programs, change the ON/OFF status and values of devices and labels used in the program.	
Forced Input Output Registration/ Cancellation		Register/cancel the forced input/output of the device 'X'/'Y'.	
Device Test with Execution Condition			-
	Register Device Test with Execution Condition	Register the device test with execution condition.	(Common)
	Check/Disable Register Device Test with Execution Condition	Check/disable the registration of device test with execution condition.	
	Batch Disable Device Test with Execution Condition	Cancel the device test with execution condition in batch.	
Sampling Trace			-
	Open Sampling Trace	Display the Sampling Trace screen.	(Common)
Scan Time Measurement		Measure the scan time of a desired section.	
Step Execution			-
	Stop	Stop the step execution.	(Common)
	Cancel	Cancel the step execution.	
	Break Execution	Execute the break execution.	
	Step Execution	Execute the step execution.	
	Execution Option	Display the "Execution Option" screen of the step execution.	

Debug (common function)			Reference
Break Setting			-
	Set/Cancel Break Point	Set a break point at the cursor position, or cancel the set break point.	(Common)
	Enable/Disable Break Point	Enable/disable the break point at the cursor position.	
	Cancel All Break Points	Cancel all break points.	
	Break Point Window	Display the Break Point window.	
	Cancel All Break Devices	Cancel all break devices.	
	Break Device Window	Display the Break Device window.	
Skip Setting			-
	Set/Cancel Skip Range	Set a skip range, or cancel the set skip range.	(Common)
	Enable/Disable Skip Range	Enable/disable the skip range at the cursor position.	
	Cancel All Skip Ranges	Cancel all skip ranges.	
	Skip Range Window	Display the Skip Range window.	

Diagnostics (common function)		Reference
PLC Diagnostics	Diagnose the operating status of the programmable controller CPU.	(Common)
Ethernet Diagnostics	Diagnose Ethernet.	
CC IE Control Diagnostics	Diagnose CC-Link IE Controller Network.	
CC IE Field Diagnostics	Diagnose CC-Link IE Field Network.	
MELSECNET Diagnostics	Diagnose MELSECNET/10(H).	
CC-Link Diagnostics	Diagnose CC-Link and CC-Link/LT.	
System Monitor	Monitor the system status of the programmable controller CPU.	
Online Module Change	Change modules online.	

Tool (common function)			Reference
IC Memory Card			-
	Read IC Memory Card	Read data from the IC memory card.	(Common)
	Write IC Memory Card	Write data to the IC memory card.	
Check Program		Check programs of the project without labels and display errors.	(Simple)
Check Parameter		Check parameters and display errors.	(Common)
Options		Set various options.	Chapter 14
Key Customize		Change the settings of the shortcut keys.	(Common)
Device/Label Automatic-Assign Setting		Set device range to be automatically assigned to a label.	Section 5.7
Block Password		Set a block password to data.	(Common)
Confirm Memory Size		Calculate the size of files to be written to the programmable controller CPU.	
Set TEL Data/Connect via Modem			-
	Line Connection	Connect the line.	(Common)
	Line Disconnection	Disconnect the line.	
	AT Command Registration	Register a modem between a personal computer and a serial communication module, or a personal computer and an FXCPU.	
	Phone Book	Set phone numbers of targets such as remote access targets.	
	Options	Set options for TEL data.	
LCPU Logging Configuration Tool		Start the LCPU logging configuration tool.	
Ethernet Adapter Module Configuration Tool		Start the Ethernet adapter module configuration tool.	

Tool (common function)			Reference
Built-in I/O Module Tool			-
	Positioning Monitor	Display the Positioning Monitor screen.	(Common)
	High-Speed Counter Monitor	Display the High-Speed Counter Monitor screen.	
	I/O Monitor	Display the I/O Monitor screen.	
Check Intelligent Function Module Parameter			-
	Check Auto Refresh Duplication	Check the duplication of devices set in the Auto refresh function and display the result.	(Common)
Intelligent Function Module Tool			-
	Analog Module	–	(Intelligent)
	Offset/Gain Setting	Configure the offset/gain setting of the analog module.	
	Q61LD Two-Point Calibration Setting	Configure the Q61LD two-point calibration setting.	
	Q61LD Default Setting	Configure the Q61LD default setting.	
	Temperature Input Module	–	
	Offset/Gain Setting	Configure the offset/gain setting of the temperature input module.	
	Temperature Control Module	–	
	Auto Tuning	Execute the auto tuning function of the temperature control module.	
	Sensor Correction Function	Execute the sensor correction function of the temperature control module.	
	Counter Module	–	
	Preset	Execute the preset function of the counter module.	
	QD75/LD75 Positioning Module	–	
	Positioning Monitor	Execute the positioning monitor.	
	Positioning Test	Execute the positioning test.	
	Wave Trace	Execute the wave trace.	
	Location Trace	Execute the location trace.	
	Serial Communication Module	–	
	Circuit Trace	Execute the circuit trace.	
	Predefined Protocol Support Function	Start the predefined protocol support function.	
Language Selection		Select a language used in a project.	(Common)

Window (common function)		Reference
Cascade	Tile windows in overlapping display.	(Common)
Tile Vertically	Tile windows vertically.	
Tile Horizontally	Tile windows horizontally.	
Arrange Icons	Arrange the icons at the bottom of the window.	
Close All	Close all open windows.	
(Switch to other window)	Display the open window.	
Window	Display a list of open windows. Also open or arrange specified windows.	

Help (common function)			Reference
GX Works2 Help		Display the GX Works2 Help screen.	(Common)
Operating Manual			-
	GX Works2 Beginner's Manual (Simple Project)	Display the operating manuals.	(Common)
	GX Works2 Beginner's Manual (Structured Project)		
	Operating Manual Common		
	Operating Manual (Simple Project)		
	Operating Manual (Structured Project)		
	Operating Manual (Intelligent Function Module)		
About		Display product information such as the version.	

■ List of functions for setting labels

The following table shows the functions for setting and editing labels.

Edit (function for label setting)			Reference
Delete		Delete the selected data.	-
Select All		Select all items.	Section 5.5.4
New Declaration (Before)		Add a row above the cursor position.	
New Declaration (After)		Add a row below the cursor position.	
Delete Row		Delete a row at the cursor position.	
Read from CSV File		Read label settings from the CSV file.	Section 5.8
Write to CSV File		Write label settings to the CSV file.	
System Label			-
	Confirm Update of System Label Database	Reflect system label information changed in another project on global labels.	Section 5.2
	Import System Label	Import system label information and reflect it on global labels.	
	Register Device Name of System Label	Register a selected global label as a system label.	
	Disable System Label Relation	Disable the relation between a selected global label and a system label.	
	Execute Verification Synchronous with System Label	Resolve a mismatch when system label information contains it.	-

■ List of functions for editing device comments

The following table shows functions for editing device comments.

Edit (function for editing device comments)			Reference
Delete		Delete the selected data.	-
Select All		Select all data being displayed.	(Common)
Import from Sample Comment			
	Special Relay/Special Register	Utilize sample comments of SM/SD.	
	Intelligent Function Module	Utilize sample comments of intelligent function module device.	
Clear All		Delete all device comment data.	
Read from CSV File		Read device comments from the CSV file.	
Write to CSV File		Write device comments to the CSV file.	
Hide Bit Specification Information		Hide the bit-specified word device comment of the selected row.	
Show Bit Specification Information		Display the bit-specified word device comment of the selected row.	
Cut The Range including Hidden Bit Specification Information		Cut data including hidden bit-specified comment.	
Copy The Range including Hidden Bit Specification Information		Copy data including hidden bit-specified comment.	
Paste The Range including Hidden Bit Specification Information		Paste data including hidden bit-specified comment.	

■ List of functions for setting device memory

The following tables show the functions for setting device memory.

Edit (function for setting device memory)		Reference
Delete	Delete the selected data.	-
Insert Row	Insert a row at the cursor position.	(Common)
Input Device	Enter a device.	
Paste Text	Enter a character string.	
FILL	Set the same value to continuous devices simultaneously.	

Find/Replace (function for setting device memory)		Reference
Find Device Cell	Search for a device.	(Common)

View (function for setting device memory)			Reference
Display Mode			-
	Binary	Display data in binary.	(Common)
	Octal	Display data in octal.	
	Decimal	Display data in decimal.	
	Hexadecimal	Display data in hexadecimal.	
	Float	Display data in real number.	
	String	Display data in character string.	
	String (ASCII only)	Display data in ASCII string.	
Register			-
	16-bit	Display data in units of words.	(Common)
	32-bit	Display data in units of double words.	
	64-bit	Display data in units of 64 bits.	
Setup		Change the editor size.	

Tool (function for setting device memory)		Reference
Read Device Memory from PLC	Read device memory data from the programmable controller CPU.	(Common)
Write Device Memory to PLC	Write device memory data to the programmable controller CPU.	
Read from Excel File	Read data from an Excel file.	
Write to Excel File	Write data to an Excel file.	

■ List of functions for verification result

The following tables show the functions for verification result.

Edit (function for verification result)		Reference
Write to CSV File	Write verification result to a CSV file.	(Common)

Find/Replace (function for verification result)		Reference
Next Unmatch	Move to the next mismatched data.	(Common)
Previous Unmatch	Move to the previous mismatched data.	

View (function for verification result)		Reference
Return to Result List	Return to the <<Verify Result List>> tab from the <<Detail Verify Result>> tab.	(Common)
Close Detail Result	Close the <<Detail Verify Result>> tab being displayed.	
Close All Detail Result	Close all <<Detail Verify Result>> tabs being displayed.	

■ List of functions for executing sampling trace

The following tables show the functions for executing sampling trace.

View (function for executing sampling trace)			Reference
Result Position			(Common)
	Move to Trigger Point	Display the trigger position.	
Switching Display Items			-
	Device	Display/hide the display item titles.	(Common)
	Address		
	Comment		
	Data Types		
	Radix		
Timing Chart Scale			-
	Narrow Scale	Change the display width of the timing chart scale.	(Common)
	Wide Scale		
Trend Graph Scale			-
	Narrow Scale	Change the display width of the trend graph scale.	(Common)
	Wide Scale		
	Initial Display		
Additional Information			-
	Past Time	Display/hide the additional information.	(Common)
	Program Name		

Debug (function for executing sampling trace)			Reference
Sampling Trace			-
	Open Sampling Trace	Display the Sampling Trace screen.	(Common)
	Trace Setting	Display the screen on which the sampling trace conditions are set.	
	Start Trace	Start sampling trace.	
	Stop Trace	Suspend sampling trace.	
	Execute Manual Trigger	Generate a trigger at any given timing.	
	Register Trace	Write trace settings to the programmable controller CPU. Execute this to control the sampling trace start by a sequence program. Sampling trace starts when the Trace start command (SM801) is executed after executing "Register Trace".	
	Forced Execution Registration Effective	Enable to execute the sampling trace from the peripherals.	
	Display Trace Buffer Condition	Display trace data storage status.	
	Export CSV Data	Save the trace data (trace settings + results) to a personal computer in CSV file format.	
	Read from PLC	Read the sampling trace data (trace settings + results) from the programmable controller CPU.	
	Write to PLC	Write the trace data (trace settings + results) to the programmable controller CPU.	
	Delete All Data	Delete all information including the device data registered and the sampling trace result displayed on the Sampling Trace screen.	

1.3.2 List of functions for editing in ladder language

For the functions for editing in the ladder language, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Simple Project)

1.3.3 List of functions for editing SFC diagrams

For the functions for editing SFC diagrams, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Simple Project)

1.3.4 List of functions for editing SFC block list

For the functions for editing SFC block list, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Simple Project)

1.3.5 List of functions for editing in ST language

The following tables show the functions for editing with the ST editor.

Edit (function for editing in ST language)		Reference
Delete	Delete the selected data.	-
List Operands	Display the screen for inserting a label by selecting an existing label.	Section 6.2.2
Display Template	Insert a template corresponds to the instruction, function, or control syntax.	Section 7.1.4
Mark Template (Left)	Set an argument of the template in the selected status from the left by selecting the menu each time.	
Mark Template (Right)	Set an argument of the template in the selected status from the right by selecting the menu each time.	

Find/Replace (function for editing in ST language)		Reference
Jump	Jump to the specified row.	Section 9.1.1
Bookmark		-
Toggle Bookmark	Set a bookmark at the cursor row. The bookmark is deleted when one is already set at the cursor row.	Section 9.1.2
Bookmark List	Jump to the specified bookmark from the bookmark list.	
Next Bookmark	Display the next bookmark position.	
Previous Bookmark	Display the previous bookmark position.	
Delete All Bookmarks	Cancels all bookmarks.	

View (function for editing in ST language)		Reference
Display Compile Result	Display the compilation result in a list form.	Section 6.2.7
Zoom		-
Set Zoom Factor	Change the display size of the program.	Section 6.2.4
Increase Zoom		
Decrease Zoom		
Zoom Header/Body		-
Header	Open the label setting screen in the selected POU.	Section 6.2.9
Body	Open the program editor in the selected POU.	
Open Header	Open the label setting screen for the program being edited.	Section 6.2.6

Online (function for editing in ST language)		Reference
Monitor		-
Start Monitoring	Start monitoring with the split window format that displays monitor data of numeric value and character strings.	Section 12.4
Start Monitoring (Bit Type only)	Start monitoring only bit type devices/labels.	

1.3.6 List of functions for editing in structured ladder/FBD language

The following tables show the functions for editing with the structured ladder/FBD editor.

Edit (function for editing in structured ladder/FBD language)			Reference
Delete		Delete the selected data.	-
Select Mode		Change to the contact and coil input mode.	Section 8.4.1
Interconnect Mode		Change to the line drawing mode.	Section 8.3.2
Auto Connect		Specify and connect the start and end points to draw a line.	Section 8.3.3
Guided Mode			-
	Guided Editing	Change to the keyboard input mode.	Section 8.10
	Overwrite Mode	Overwrite the ladder symbol entered in Guided editing at the cursor position.	
	Insert Mode	Insert the ladder symbol entered in Guided editing at the cursor position.	
	Line Mode	Change the input format to draw lines in Guided editing.	
	Auto Comment	Add a comment entry field at the start of the ladder block added in Guided editing.	
Recalculate Line		Arrange a line automatically to redraw it.	Section 8.3.5
Insert Row		Insert a row in a ladder being edited.	Section 8.3.6
Insert Column		Insert a column in a ladder being edited.	
New Ladder Block List			-
	Top	Insert a new ladder block at the start of all ladder blocks.	Section 8.8.1
	Before	Insert a new ladder block in front of a ladder block being edited.	
	After	Insert a new ladder block after a ladder block being edited.	
	Bottom	Insert a new ladder block at the end of all ladder blocks.	
Input Instruction		Open a Input Instruction screen.	Section 8.2.2
Ladder Symbol			-
	Open Contact	Insert at the cursor position.	Section 8.2.1
	Close Contact	Insert at the cursor position.	
	Coil	Insert at the cursor position.	
	Jump	Insert at the cursor position.	
	Return	Insert at the cursor position.	
	Open Branch	Insert at the cursor position.	
	Close Branch	Insert at the cursor position.	
	Input Label	Insert at the cursor position.	
	Output Label	Insert at the cursor position.	
	Horizontal Line Segment	Insert at the cursor position.	
	Vertical Line Segment	Insert at the cursor position.	
	Rising Pulse	Insert at the cursor position.	
	Falling Pulse	Insert at the cursor position.	
	Rising Pulse Close	Insert at the cursor position.	
	Falling Pulse Close	Insert at the cursor position.	
	Comment	Insert a comment entry field at the cursor position.	
	Ladder Block Label	Display the Ladder Block screen.	
	Left Power Rail	Display/hide the left power rail.	Section 8.8.7

Edit (function for editing in structured ladder/FBD language)			Reference
List Operands		Display the screen for inserting a label by selecting an existing label.	Section 6.2.2
Number of Pins			-
	Increment	Increase the number of arguments of functions and function blocks.	Section 8.6.3
	Delete	Decrease the number of arguments of functions and function blocks.	
Ladder Block List		Display a list of ladder blocks in a program.	-
Signal Configuration			-
	Configure	Set the type of a contact and a coil.	Section 8.5
	Toggle	Change the contact and coil type per execution in the following order. • Contact: Open Contact → Close Contact • Coil: Normal → Negation → Set → Reset	

Find/Replace (function for editing in structured ladder/FBD language)		Reference
Jump	Jump to the specified ladder block number.	Section 9.2.1

View (function for editing in structured ladder/FBD language)			Reference
View Mode			Section 8.7.5
	Label	Display a variable by its entered format.	
	Device	Display a device/address in device format. The variable is displayed as an assigned device in device format.	
	Address	Display a device/address in address format. The variable is displayed as an assigned device in address format.	
	Comment	Display a label comment.	
	Change Label-Device-Address Mode	Switch the display format in order (label, device, address).	
	Change Label-Comment Mode	Switch the display between label and comment.	
All Device Display		Batch-change all labels on the program editors to the device display.	
Cancel All Device Display		Cancel the device display on the program editors, and display data in the format at the time of data entry.	
Grid		Show a grid on the screen being edited to display the start/end positions of a line.	Section 8.8.8
Print Wrap Position		Display the wrapping position for printing.	Section 8.11
Display Compile Result		Display the compilation result in a list form.	Section 6.2.7
Zoom			-
	Set Zoom Factor	Change the display size of the program.	Section 6.2.4
	Increase Zoom		
	Decrease Zoom		
Zoom Header/Body			-
	Header	Open the label setting screen in the selected POU.	Section 6.2.9
	Body	Open the program editor in the selected POU.	
Open Header		Open the label setting screen for a program being edited.	Section 6.2.6

MEMO

2 SCREEN CONFIGURATION

This chapter explains the screen configuration of GX Works2.

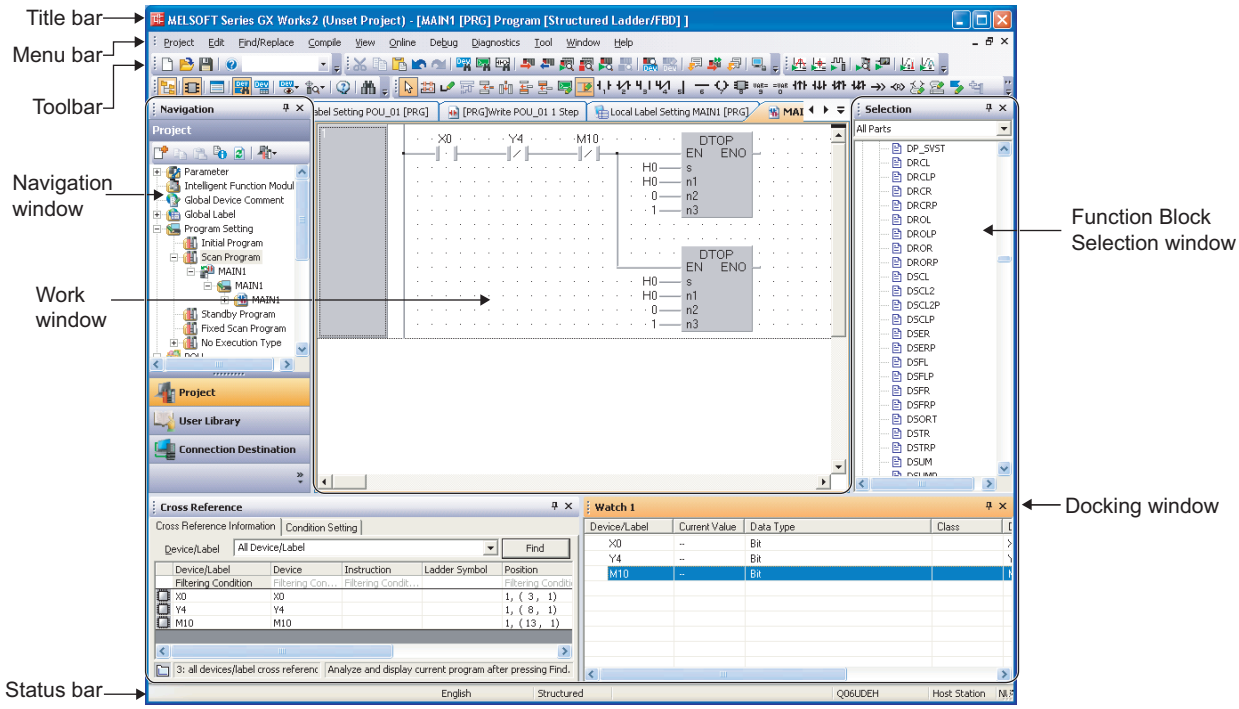
2.1 Overview of Screen Configuration 2-2

2.1 Overview of Screen Configuration

Q CPU L CPU FX

This section explains the main frame (basic screen) of GX Works2 that is displayed when it is started up. The following screen shows a main frame configuration in which a work window and docking windows are displayed.

Screen display



Display contents

Name	Description	Reference
Title bar	Display a project name.	–
Menu bar	Display menu options for executing each function.	–
Toolbar	Display tool buttons for executing each function.	Appendix 1
Work window	A main screen used for operations such as programming, parameter setting, and monitoring.	GX Works2 Version 1 Operating Manual (Common)
Docking window	A sub screen to support operations performed on a work window.	
Navigation window	Display contents of a project in tree format.	Section 4.1
Function Block Selection window	Display a list of functions (such as function blocks) used for programming.	Section 6.2.1
Output window	Display compilation and check results (errors and warnings).	Section 10.6
Cross Reference window	Display cross reference results.	GX Works2 Version 1 Operating Manual (Common)
Device List window	Display the device usage list.	
Watch window 1 to 4	A screen used for monitoring and changing current device values.	
Intelligent Function Module Monitor 1 to 10	A screen used for monitoring intelligent function modules.	
Find/Replace window	A screen used for searching and replacing character strings in the project.	
Status bar	Display information about a project being edited.	

3 PROGRAMMING PROCEDURE

This chapter explains how to create programs in Structured project.

3.1 Creating Programs 3-2

3.1 Creating Programs

Q CPU L CPU FX

This section explains the general operating steps from the creation of a program in Structured project to the execution of the created program in the programmable controller CPU.

1. Creating a new project

Procedure	Reference
Start up GX Works2.	GX Works2 Version 1 Operating Manual (Common)
Create a new Structured project. To reuse an existing Structured project, open that Structured project.	

2. Setting parameters

Procedure	Reference
Set parameters.	GX Works2 Version 1 Operating Manual (Common)
Check parameters.	

3. Configuring programs

Procedure	Reference
Create program files.	Chapter 4
Create tasks.	
Create POUs.	
Register POUs (program blocks) to the tasks.	

4. Setting labels

Procedure	Reference
Define global labels.	Chapter 5
Define local labels.	

(To the next page)

(From the previous page)

5. Editing programs

Procedure	Reference
Edit programs of each POU.	Chapter 6 Chapter 7 Chapter 8

6. Compiling programs

Procedure	Reference
Compile a program or compile all programs.	Chapter 10

7. Connecting a personal computer to the programmable controller CPU

Procedure	Reference
Connect a personal computer to the programmable controller CPU.	GX Works2 Version 1 Operating Manual (Common)
Set the connection target.	

8. Writing data to the programmable controller CPU

Procedure	Reference
Write parameters to the programmable controller CPU.	Chapter 11
Write sequence programs to the programmable controller CPU.	

9. Confirming the operation

Procedure	Reference
Monitor the execution status of sequence programs.	Chapter 12

10. Ending the project

Procedure	Reference
Save the project.	GX Works2 Version 1 Operating Manual (Common)
Exit GX Works2.	

MEMO

4 PROGRAM CONFIGURATIONS

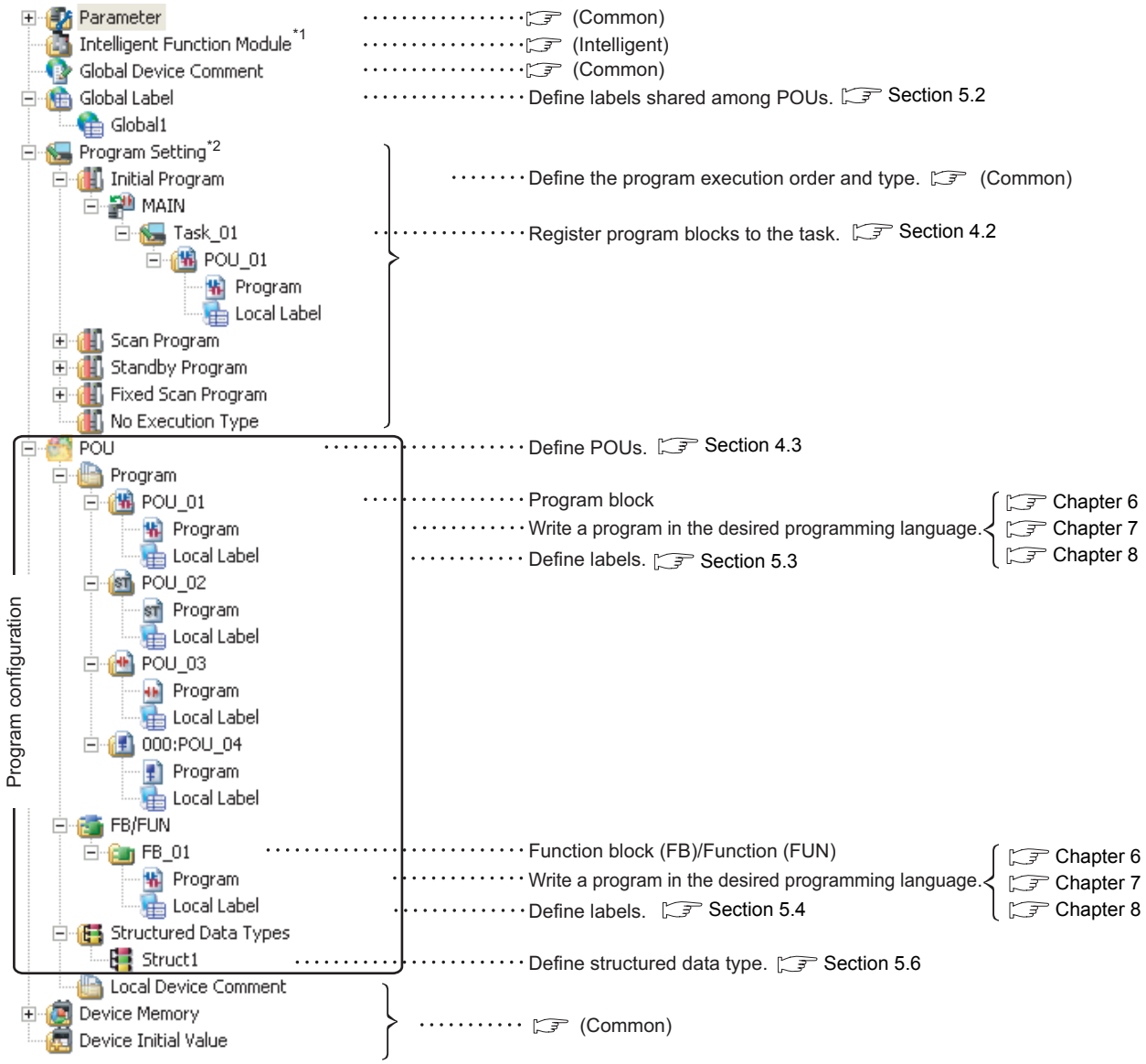
In Structured project, sequence programs are configured by using tasks and POUs.
This chapter explains the program configurations of Structured project.

4.1 Program Configurations of Structured Project 4-2
4.2 Creating Program Files and Tasks. 4-3
4.3 Creating POUs 4-10
4.4 Using POUs 4-14

4.1 Program Configurations of Structured Project

Q CPU L CPU FX

This section explains the configurations of Structured project that are displayed in a tree format in the Project view.
For (Common) and (Intelligent) indicated as the reference, refer to the following manuals respectively:
(Common) .....GX Works2 Version 1 Operating Manual (Common)
(Intelligent) .....GX Works2 Version 1 Operating Manual (Intelligent Function Module)



*1: For FXCPU, this item is not displayed.

*2: For FXCPU, no classification for program execution type. Only one item, "Execution Program", is displayed.

4.2 Creating Program Files and Tasks

Q CPU L CPU FX

This section explains how to register program blocks executed on the programmable controller CPU, and setting the executing conditions of programs using program files and tasks.
For details of program files and tasks, refer to the following manual.
☞ MELSEC-Q/L/F Structured Programming Manual (Fundamentals)

4.2.1 Procedure for creating program files and tasks

The following explains the procedure for creating a program file and task.

1. Creating a program file and task

Procedure	Reference
Create a program file. • Select [Project] ⇒ [Object] ⇒ [New].	GX Works2 Version 1 Operating Manual (Common)
Create a task. • Select the program file folder and perform the following operation. Select [Project] ⇒ [Object] ⇒ [New].	

2. Registering program blocks to the task

Procedure	Reference
Display the Task Setting screen. • Select Project view ⇒ "Program Setting" ⇒ "(program setting)" ⇒ "(program file)" ⇒ "(task)".	GX Works2 Version 1 Operating Manual (Common)
Set program blocks to be registered to the task.	Section 4.2.2

3. Setting the executing condition

Procedure	Reference
Set the executing condition of the program file on the <<Program>> tab of PLC parameter.	GX Works2 Version 1 Operating Manual (Common)
Set the executing condition on the Property screen of the task. • Select the task and perform the following operation. Select [Project] ⇒ [Object] ⇒ [Property].	Section 4.2.3

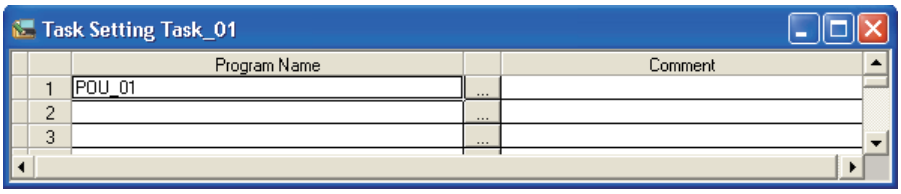
4.2.2 Registering program blocks to tasks

Register program blocks to a task and specify the executing order. Only the program blocks that are registered to the task are compiled. (☞ Chapter 10)

Operating procedure

1. **Select Project view ⇒ "Program Setting" ⇒ "(program setting)" ⇒ "(program file)" ⇒ "(task)".**

2. **Right-click and select [Open Task Setting] from the shortcut menu.**
   The Task Setting screen is displayed.



3. **Set the items on the screen.**

Item	Description	Maximum number of characters
Program Name	Enter a program block name. Click [...] to set a program block name on the Program Selection screen.	32
Comment	Enter comments for the program block. A new line can be inserted in a cell by pressing the Ctrl + Enter keys.	1024

Point

- **Program blocks that can be registered**
  A single program block can be registered to any one of tasks for only once. Only the program blocks that are not registered to any of the tasks are displayed on the Program Selection screen.
- **Executing order of program blocks registered to a task**
  Structured ladder/FBD or ST programs are executed in the order they are registered to a task.
  SFC program is executed in the order of block number, regardless of the order they are registered to the task.

■ Registering tasks

A maximum number of tasks that can be created in a single project is 124. A maximum number of program blocks that can be registered to tasks is 800.
However, the number of tasks that can be registered to a program file, the number of program blocks that can be registered to a task, and the type of program block that can be registered to a single task differ according to the selected programming language.

● Maximum number of tasks that can be created in a single program file and the maximum number of program blocks that can be registered to a single task

Programming language of program block registered to the first task	Maximum number of tasks that can be created in a single program file	Maximum number of program blocks that can be registered to a single task
Ladder	1	1
SFC		320*1
ST	124	320
Structured ladder/FBD		

*1: For Basic model QCPU/Q00UJ/Q00U/Q01U/Q02U/L02, the maximum number of SFC blocks is 128.

● Program block that can be registered to a single task

○: Applicable ×: Not Applicable

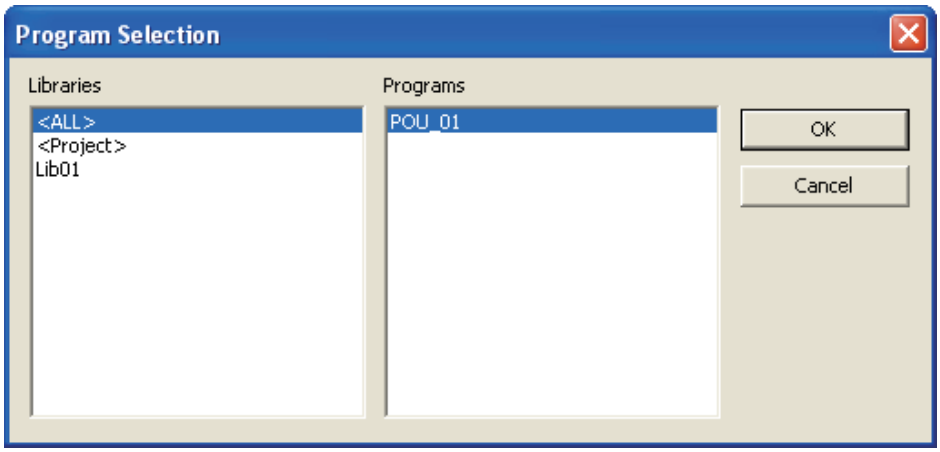
Programming language	Program block that can be registered to a single task			
	Ladder	SFC	ST	Structured ladder/FBD
Ladder	○	×	×	×
SFC	×	○	×	×
ST	×	×	○	○
Structured ladder/FBD	×	×	○	○

■ Setting program names on the program selection screen

Set a program block on the Task Setting screen using the Program Selection screen.

Screen display

On the Task Setting screen, click [...] next to the "Program Name" entry field.



Operating procedure

1. **Select the reference source of the program block from the "Libraries" field.**

Libraries	Description
<ALL>	Browse all program blocks defined in the project and libraries.
<Project>	Browse program blocks defined in the project.
(Library name)	Browse program blocks defined in the specified library.

2. **Select a program block from the "Programs" field.**

3. **Click the [OK] button when the setting is completed.**

   The selected program block is displayed on the Task Setting screen.

4.2.3 Setting executing conditions

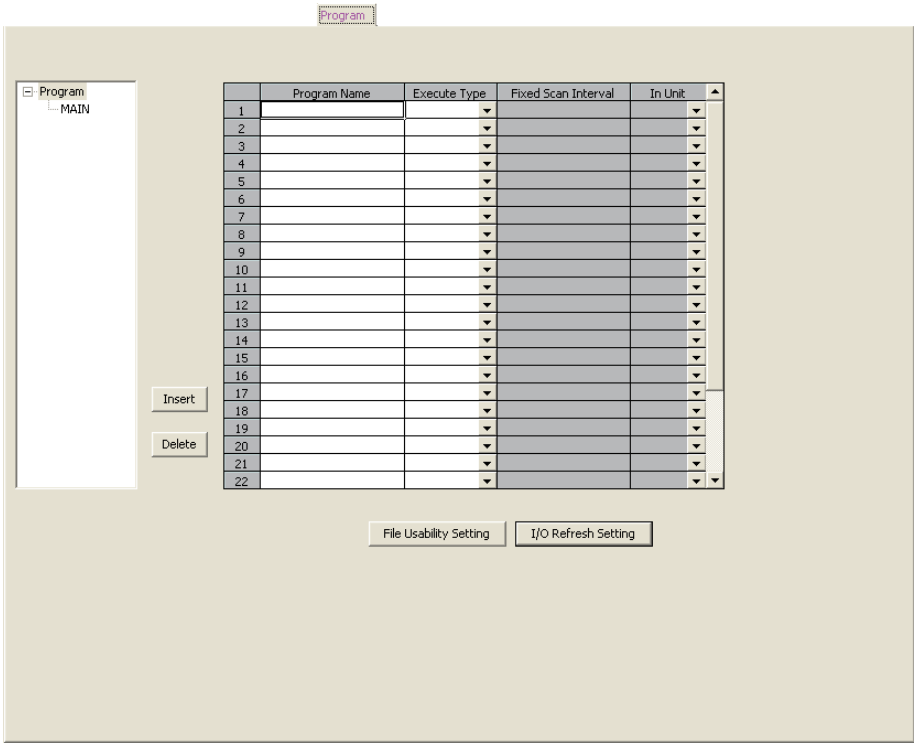
Set executing conditions for program files and tasks.

■ Executing conditions for program files (execution type)

The executing conditions for program files are set on the <<Program>> tab of PLC parameter.
This function is not supported by FXCPU.

Screen display

Select Project view ⇒ "Parameter" ⇒ "PLC Parameter" ⇒ <<Program>>.



For details of the program executing conditions, refer to the following manual.

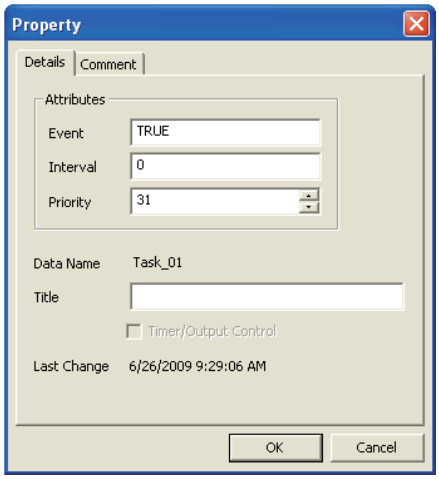
☞ User's Manual (Function Explanation, Program Fundamentals) of the CPU module to be used

■ Task executing conditions

An executing condition for a program file can be set to a task.
A task executing condition is set on the Property screen of the task.
Select the task to be set in the Project view in advance.

Screen display

Select [Project] ⇒ [Object] ⇒ [Property].



Operating procedure

- Set the items on the screen.

Item			Description	Task executing condition
Attributes	Event	TRUE	Execute the task in every scan.	Scan execution
		FALSE	Execute the task in the cycle specified in the "Interval" field.	Fixed scan execution
		Device or label name	Execute the task when the specified device or label is TRUE.	Event execution
	Interval		Set the cycle time to execute the task in a constant cycle. (Enter FALSE in the "Event" field.) Set the cycle time in time type format (Ex.: T#100ms, T#24d20h31m23s647ms). For details of time type format, refer to the following manual. ☞ MELSEC-Q/L/F Structured Programming Manual (Fundamentals) Do not set shorter time than the scan time of sequence program.	
	Priority		Set the task execution priority in the range from 0 to 31. Tasks with smaller values are executed by priority. Tasks of the same priority are executed in the alphabetical order of task data names.	
Title			Enter a title of the task.	
Timer/ Output Control		Checked	The outputs and the current values of timers in the task are reset when the task is not executed.	
		Not checked	The outputs and the current values of timers in the task are retained when the task is not executed.	

Point

- **Interruption start for QCPU (Q mode)/LCPU**
  To enable an interruption start, set an interrupt pointer number (I0 to I31) in the "Event" field. In this case, create a program using the basic instruction EI (Enable Interrupt) for the program blocks registered to scan execution tasks.
- **Interruption start for FXCPU**
  The following shows the settings for FXCPU.
  • I□01 (rising input interruption), I□00 (falling interruption)
  • I6□□ to I8□□ (timer interruption)
  • I010 to I060 (counter interruption)
  For details, refer to the following manual.
  ☞ FXCPU Structured Programming Manual [Device & Common]
- **When the program block registered to the task is created in the ladder**
  When the program block registered to the task is created in the ladder, items of "Attributes" cannot be set.
- **When the program end instruction is used**
  When the program end instruction such as the FEND or GOEND instruction is used, program blocks and/or tasks following the program end instruction are not executed.

The following tables show the task executing order according to the set execution type (scan execution (priority: high/low), fixed scan execution or event execution) in the task property setting.

Task name	Task attributes			Task executing condition
	Event	Interval	Priority	
Task1	TRUE	0	31	Scan execution (priority: low)
Task2	M0	0	31	Event execution
Task3	FALSE	T#100ms	31	Fixed scan execution
Task4	TRUE	0	30	Scan execution (priority: high)

Executing order	Task name	Execution timing
1	Task4	Executed in every scan
2	Task1	Executed in every scan
3	Task2	When M0 turned ON
4	Task3	In every 100ms

4.3 Creating POUs

Q CPU L CPU FX

This section explains how to create POUs.
A POU (abbreviation for Program Organization Unit) is a unit of program defined for each function.

4.3.1 Procedure for creating POUs

The following explains the procedure for creating a POU.

1. Creating a new POU

Procedure	Reference
Create a POU. • Select [Project] ⇒ [Object] ⇒ [New].	GX Works2 Version 1 Operating Manual (Common)

2. Setting local labels

Procedure	Reference
Display the Local Label Setting screen or Function/FB Label Setting screen. • Select Project view⇒ "POU" ⇒ "Program" ⇒ "(POU)" ⇒ "Local Label".	Chapter 5
Set labels that are used only within the POU.	

3. Editing the program

Procedure	Reference
Display the program editor. • Select Project view ⇒ "POU" ⇒ "Program" ⇒ "(POU)" ⇒ "Program".	Chapter 6
Edit the program in the specified programming language.	

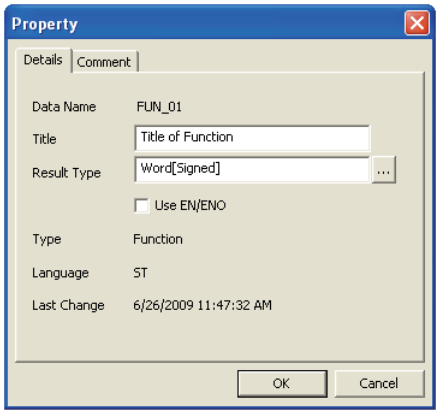
4.3.2 Setting properties of functions and function blocks

Set properties of a function and function block.
Select a function or function block to be set in the Project view in advance.

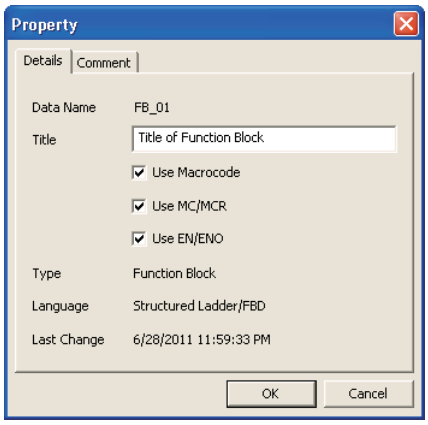
Screen display

Select [Project] ⇒ [Object] ⇒ [Property].

<For function>



<For function block>



Operating procedure

- Set the items on the screen.

Item		Description
Result Type		Set the data type of return value of the function. Click [...] and select a data type from the list.
Use Macrocode*1, *2	Checked	Apply function block program codes to each location where instances are used at compilation. Even if EN of the function block is OFF, the output variable is retained at ON. To turn OFF the output variable when EN is OFF, select the "Use MC/MCR" check box below.
	Not checked	Create function block program codes for each function block at compilation. Codes are created to call function blocks for each location where instances are used. To call function blocks, use automatically assigned devices. (☞ Section 5.7)
Use MC/MCR *1, *2, *3	Checked	Apply function block program codes using the MC/MCR instruction to each location where instances are used at compilation.
	Not checked	Apply function block program codes using the CJ instruction to each location where instances are used at compilation.
Use EN/ENO*1, *2	Checked	Become a function or function block with EN/ENO.
	Not checked	Become a function or function block without EN/ENO.

*1: This item cannot be selected when using ladder function blocks.

*2: This item cannot be selected when using ST function blocks in Simple project.

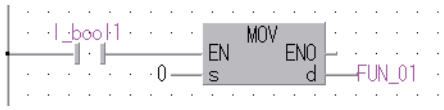
*3: This item can be selected only when the check boxes of both "Use Macrocode" and "Use EN/ENO" items are checked.

Point

● **"Use MC/MCR"**
- This check box can be checked only if both of the "Use EN/ENO" and "Use Macrocode" check boxes are checked.
- If the MC/MCR instruction is used and the function block is not executed, the outputs and the current values of timers in the function block are reset. (If the instruction is not used, the current values are retained).

● **Return value of function**
Program the function names as labels in a function to set a return value.
Setting function names as labels is not needed. Data type set on "Result Type" can be used.

Example: Set return value of function name "FUN_01" to 0
<Structured ladder/FBD>

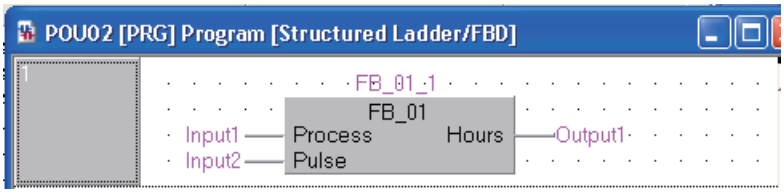


<ST>
FUN_01 := 0;

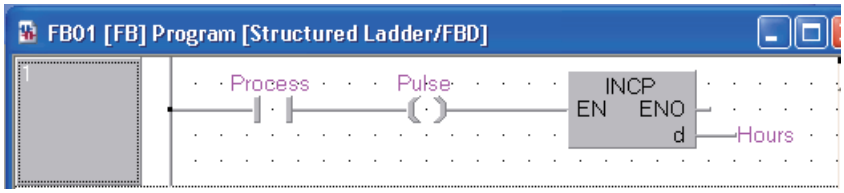
● Applying function blocks to locations where instances are used

The following shows the example of codes when the following programs are compiled.
Note that devices are assigned as follows.
- Input1: X0
- Input2: X11
- Output1: D10

<The program at the location of use>



<Function block>



Use Macrocode	Code to be created in the program at the location of use	Function block code
Applied (The check box is checked.)	LD X0 AND X11 INCP D10	None
Not applied (The check box is not checked.)	LD X0 OUT M4096 LD X11 OUT M4097 LD SM400 CALL P2048 LD SM400 MOV D6144 D10	P2048 LD M4096 AND M4097 INCP D6144 RET

Point

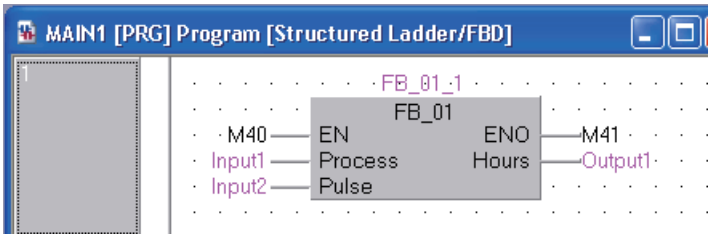
● **When the "Use Macrocode" check box is not checked**
Since pointers of automatically assigned devices are used, the number of function instances that can be created is limited to the number of pointers or less specified on the Device/Label Automatic-Assign Setting screen.
(☞ Section 5.7)
Check the "Use Macrocode" check box, if the number of set pointers or more instances are required.

● Using the MC/MCR instruction for EN control

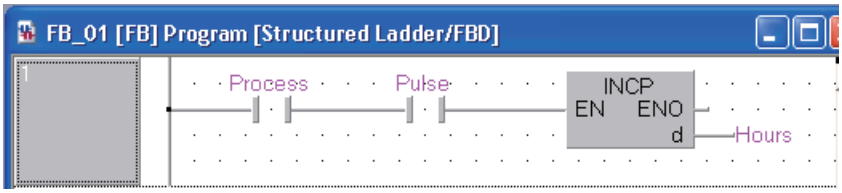
The following shows the example of codes when the following programs are compiled.
Note that devices are assigned as follows.

- Input1: X0
- Input2: X11
- Output1: D10

<The program at the location of use>



<Function block>



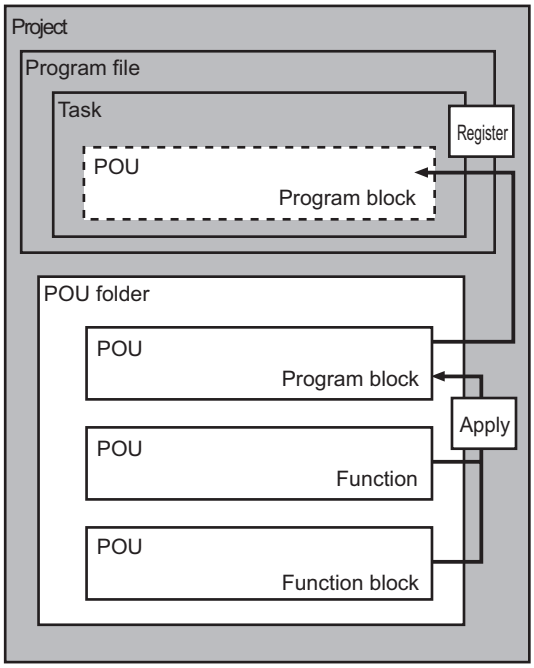
Use MC/MCR	Code to be created in the program at the location of use
MC/MCR is used (The check box is checked.)	LD M40 OUT M41 MC N0 M4096 LD X0 AND X11 INCP D10 MCR N0
MC/MCR is not used (The check box is not checked.)	LD M40 OUT M41 LDI M40 CJ P2050 LD X0 AND X11 INCP D10 P2050

4.4 Using POUs

Q CPU L CPU FX

This section explains how to use the created POUs.

- Program blocks are used by registering them to tasks. (☞ Section 4.2.2)
- Functions and function blocks are used in program blocks. (☞ Section 4.4.1)

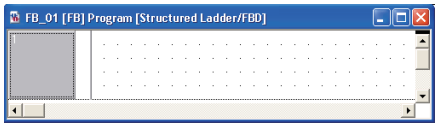


4.4.1 Using functions and function blocks

Select a function or function block from the Function Block Selection window and insert it to a program. (Function Block Selection window ☞ Section 6.2.1)

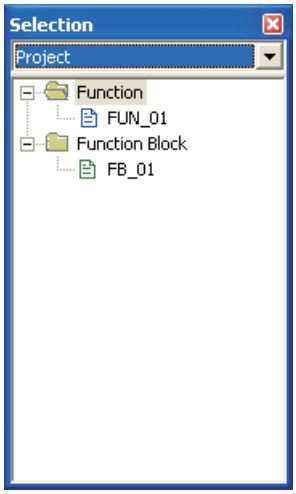
Operating procedure

1. **In the Project view, select ⇒ "POU" ⇒ "Program" ⇒ "(program)" ⇒ "Program".**
   The program editor is displayed.



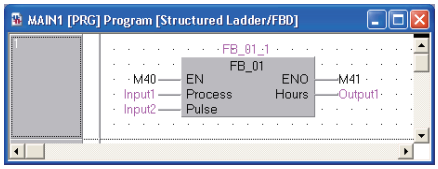
2. **Select [View] ⇒ [Docking Window] ⇒ [Function Block Selection Window] ( ).**
   The Function Block Selection window is displayed.

3. **Select "Project" from the combo box.**
   The functions and function blocks defined in the project are displayed in tree format.

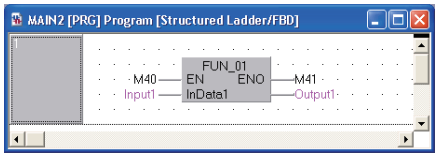


4. **Select a function or function block and then drag and drop it to the program editor.**
   The selected function or function block is inserted to the specified position on the editor.
   On the structured ladder/FBD editor, the cursor position at the time of the drop operation becomes the position of the input pin at the upper left of the function or function block.

5. **Set an instance name.**
   For a function block, set an instance name on the Label Registration/Selection screen displayed when a function/ function block is dropped. For the method for setting the Label Registration/Selection screen, refer to the following section.
   ☞ Section 6.2.2 Using labels in the program



6. **Set an argument.**
   Enter a device or label name for the argument defined in the function or function block.



Point

● **Inserting functions and function blocks**
Functions and function blocks can be also inserted by the following operation.
• Select a function or a function block from the Project view, and drag and drop it to the desired position.

■ Using function blocks created in other programming languages

Use function blocks created in other programming languages.
The following table shows the function blocks that can be called from the program/function block.

○: Applicable ×: Not applicable

		Function blocks to be called		
		Ladder	Structured ladder /FBD	ST
Program/function block that calls function blocks	Ladder*1	○	×	○
	Structured ladder /FBD	×	○	○
	ST	○	○	○

*1: Function blocks in the ladder language cannot call function blocks. Only programs can call function blocks.

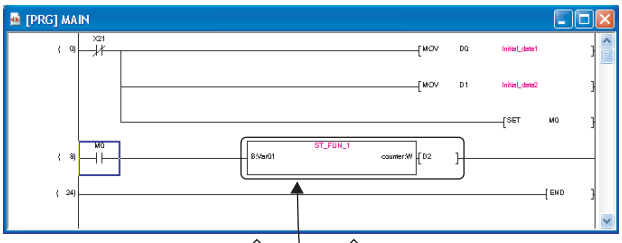
The following explains the precautions for calling function blocks from ladder to ST or from ST to Ladder language.

1) Check "Enable function block call from ladder to ST and from ST to ladder" under [Tool] ⇒ [Options] ⇒ "Compile" ⇒ "Basic Setting". (☞ Section 14.2)

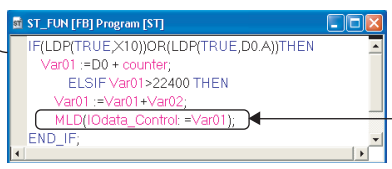
   Note that the program becomes in the uncompiled status when the option setting is changed. Compile the program again.

2) The following requirements must be satisfied when using function blocks created in the ST language in the ladder program.
   - Data type of the input/output label is any of the following types: bit, word (signed), double word (signed), single-precision real, double-precision real, string
   - The number of the input/output labels is less than 24
   - The number of characters of the input/output label is less than 16
   - The "Use Macrocode" item is checked in the option setting of the function blocks
   - The "Use EN/ENO" item is not checked in the option setting of the function blocks
   - Function block created in the structured ladder/FBD language is not used for the function block in the ST language.

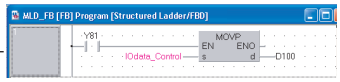
<Ladder program that calls the function block>



<Function block from structured ladder/FBD program used in ST program>



<Function block in structured ladder/FBD program>



5 SETTING LABELS

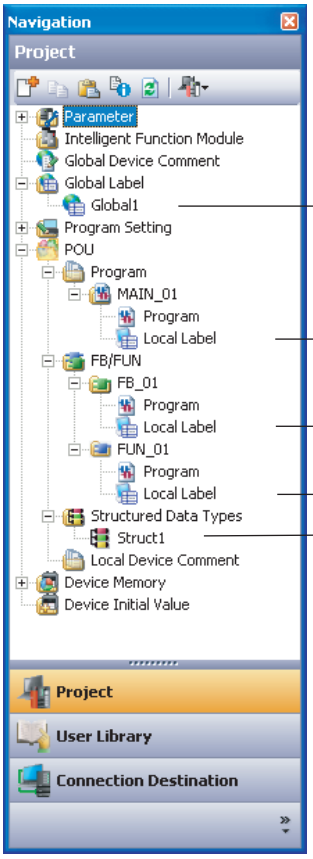
This chapter explains how to set labels.

5.1 Label Setting Screens 5-2
5.2 Setting Global Labels 5-3
5.3 Setting Local Labels for Program Blocks 5-9
5.4 Setting Labels for Functions and Function Blocks 5-11
5.5 Common Operations for Setting Labels 5-13
5.6 Setting Structured Data Type Labels 5-20
5.7 Setting Ranges for Devices Assigned Automatically 5-26
5.8 Writing/Reading Data to/from CSV Files 5-29

5.1 Label Setting Screens

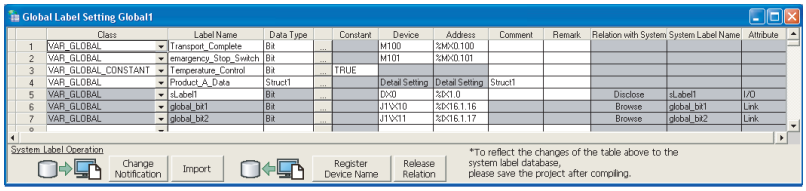
Q CPU L CPU FX

This section shows label setting screens. Labels are set on each screen below according to the type of label.



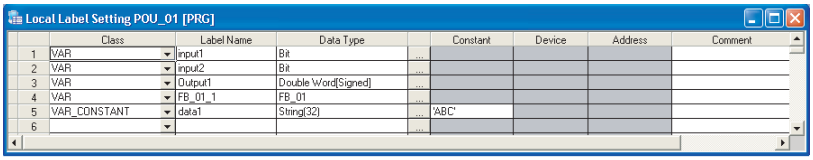
Global Label Setting screen

Define labels that can be used for all POUs in the project. (☞ Section 5.2)



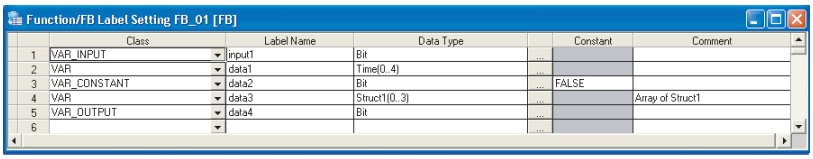
Local Label Setting screen

Define labels that can be used only for each POU (program block). (☞ Section 5.3)



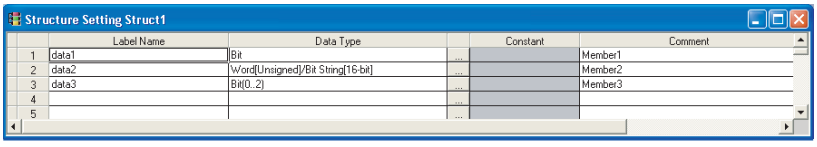
Function/FB Label Setting screen

Define labels that can be used only for each POU (function/function block). (☞ Section 5.4)



Structure Setting screen

Define structured data types to be used for labels. (☞ Section 5.6.1)



5.2 Setting Global Labels

Q CPU L CPU FX

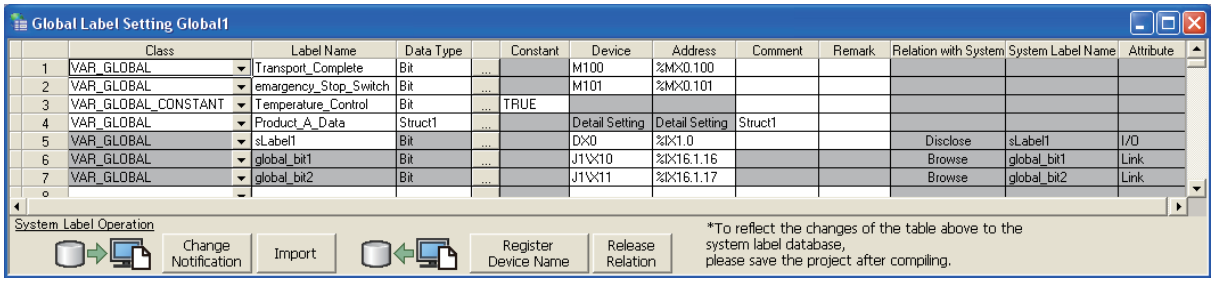
This section explains how to set global labels.
Global labels can be used in iQ Works supported products (GX Works2, MT Developer2, GT Designer3) by registering them as system labels.
For details of system labels, refer to the following manual.
(☞ iQ Works Beginner's Manual)

Point

- **System labels**
  Same label names can be used in programming between GX Works2, MT Developer2, and GT Designer3 by using system labels.
- **System label data base**
  A system label data base is a data base to manage system labels.
  A system label data base is created in the workspace when the workspace is saved in MELSOFT Navigator.
  System labels cannot be used in the workspace which does not contain a system label data base.

Screen display

Select Project view ⇒ "Global Label" ⇒ "(global label)".


Global Label Setting Global1
Class
Label Name
Data Type
Constant
Device
Address
Comment
Remark
Relation with System
System Label Name
Attribute
1 VAR_GLOBAL Transport_Complete Bit M100 %MX0.100
2 VAR_GLOBAL emargency_Stop_Switch Bit M101 %MX0.101
3 VAR_GLOBAL_CONSTANT Temperature_Control Bit TRUE
4 VAR_GLOBAL Product_A_Data Struct1 Detail Setting Detail Setting Struct1
5 VAR_GLOBAL sLabel1 Bit DX0 %IX1.0 Disclose sLabel1 I/O
6 VAR_GLOBAL global_bit1 Bit J1\X10 %IX16.1.16 Browse global_bit1 Link
7 VAR_GLOBAL global_bit2 Bit J1\X11 %IX16.1.17 Browse global_bit2 Link
System Label Operation
Change Notification
Import
Register Device Name
Release Relation
*To reflect the changes of the table above to the system label database, please save the project after compiling.

Operating procedure

- Set the items on the screen.

Item	Description	Maximum number of characters
Class	Select a label class from the list displayed by clicking ▼. (☞ Section 5.5.1)	-
Label Name	Enter a desired label name.	Ladder/ST/SFC/ Structured ladder/FBD : 32 (FB instance name: 16)
Data Type	Specify a data type from the Data Type Selection screen displayed by clicking ... .(☞ Section 5.5.3) It can also be entered directly.	128
Constant	Enter a constant value when "VAR_GLOBAL_CONSTANT" is selected for "Class" and simple type is selected for "Data Type".	128
Device Address	Set a specific device to be assigned to the label when "VAR_GLOBAL" is selected for "Class". • When a device name is entered in either column, the other column is displayed in the respective format automatically. • When the "Device" column is blank, a device is automatically assigned. • When the data type is Structure, click the "Detail Setting" cell and set devices on the Structure Device Setting screen. (☞ Section 5.6.3)	50
Comment*1,*2	Enter a label comment. Comments can be displayed on the program editor by switching display/hide of comments. (☞ Section 8.7.5)	1024
Remark*1,*2	Enter supplementary information for label comments. This item is not displayed on the program editor.	1024
Relation with System Label*2	Display the relation between the global label and system label. Class: Disclose — The global label is disclosed as a system label. Class: Browse — The global label refers the system label which is disclosed by another project. Class: Blank — There is no relation with a system label.	-
System Label Name*2	Display the name of the system label which relates to the global label.	-
Attribute*2	Display the attribute of the system label which relates to the global label.	-

*1: A new line can be inserted in a cell by pressing the Ctrl + Enter keys.

*2: The compilation is not needed after editing.

*3: For FXCPU, these items are supported by FX3G, FX3U and FX3UC only.

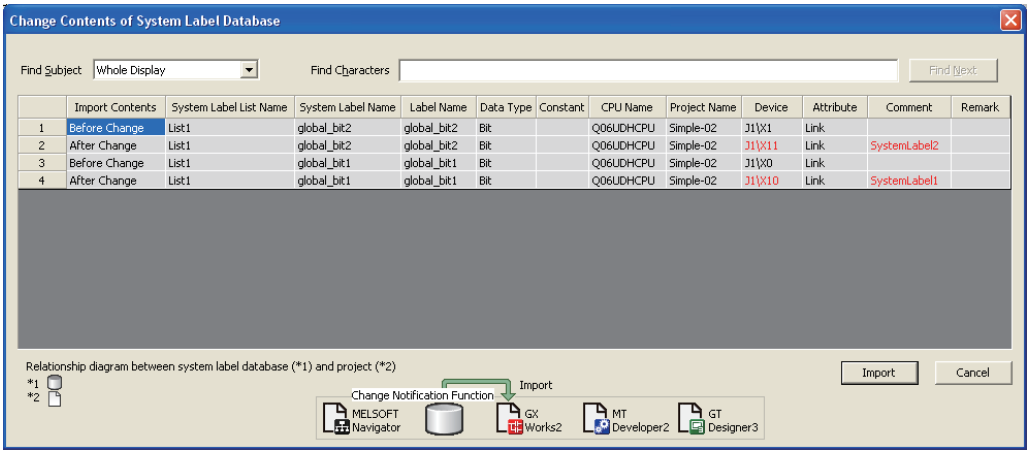
Screen button

● Change Notification **(For FXCPU, this button is supported by FX3G, FX3U and FX3UC only)**

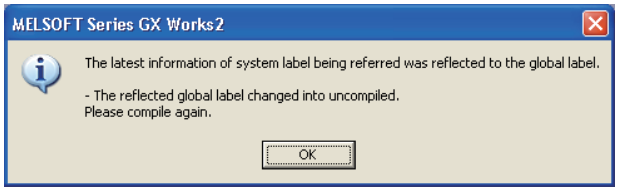
Updates the system label information.

Operation

1. Click the Change Notification button.
   The Change Contents of System Label Database screen is displayed.



2. Click the Import button.
   The information on the changed system labels are applied to the project.
   When the Cancel button is clicked, these changes will be updated at the next update.
3. The following message is displayed.


MELSOFT Series GX Works2
The latest information of system label being referred was reflected to the global label.
- The reflected global label changed into uncompiled.
Please compile again.
OK

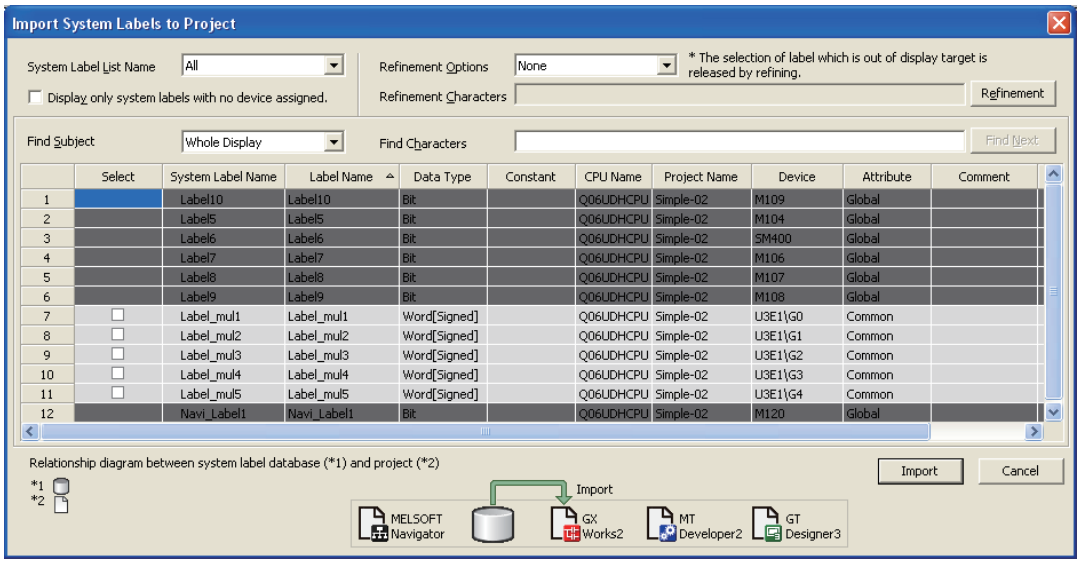
4. Click the OK button.

● Import **(For FXCPU, this button is supported by FX3G, FX3U and FX3UC only)**

Imports system labels to the project.

Operation

1. Click the Import button.
   The Import System Labels to Project screen is displayed.


Import System Labels to Project
System Label List Name
All
Refinement Options
None
* The selection of label which is out of display target is released by refining.
Display only system labels with no device assigned.
Refinement Characters
Refinement
Find Subject
Whole Display
Find Characters
Find Next
Select
System Label Name
Label Name
Data Type
Constant
CPU Name
Project Name
Device
Attribute
Comment
1 Label10 Label10 Bit Q06UDHCPU Simple-02 M109 Global
2 Label5 Label5 Bit Q06UDHCPU Simple-02 M104 Global
3 Label6 Label6 Bit Q06UDHCPU Simple-02 SM400 Global
4 Label7 Label7 Bit Q06UDHCPU Simple-02 M106 Global
5 Label8 Label8 Bit Q06UDHCPU Simple-02 M107 Global
6 Label9 Label9 Bit Q06UDHCPU Simple-02 M108 Global
7 Label_mul1 Label_mul1 Word[Signed] Q06UDHCPU Simple-02 U3E1\G0 Common
8 Label_mul2 Label_mul2 Word[Signed] Q06UDHCPU Simple-02 U3E1\G1 Common
9 Label_mul3 Label_mul3 Word[Signed] Q06UDHCPU Simple-02 U3E1\G2 Common
10 Label_mul4 Label_mul4 Word[Signed] Q06UDHCPU Simple-02 U3E1\G3 Common
11 Label_mul5 Label_mul5 Word[Signed] Q06UDHCPU Simple-02 U3E1\G4 Common
12 Navi_Label1 Navi_Label1 Bit Q06UDHCPU Simple-02 M120 Global
Relationship diagram between system label database (*1) and project (*2)
*1
*2
Import
MELSOFT Navigator
GX Works2
MT Developer2
GT Designer3
Import
Cancel

2. Check "Select" of a system label to import to the project.
3. Click the Import button.
4. The following message is displayed.

MELSOFT Series GX Works2
Imported system label to global label.
Until the project is saved, the imported system label cannot synchronize with the system label database.
Please save the project.
OK

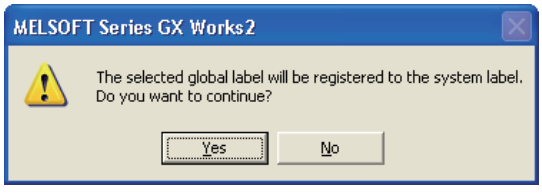
5. Click the OK button.

● Register Device Name **(For FXCPU, this button is supported by FX3G, FX3U and FX3UC only)**

Registers a global label as a system label.

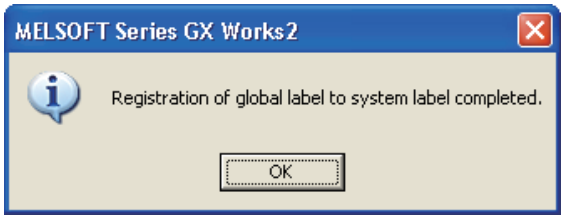
Operation

1. Select a global label to register as a system label.
2. Click the Register Device Name button.
3. The following message is displayed.



4. Click the Yes button.

5. The following message is displayed.



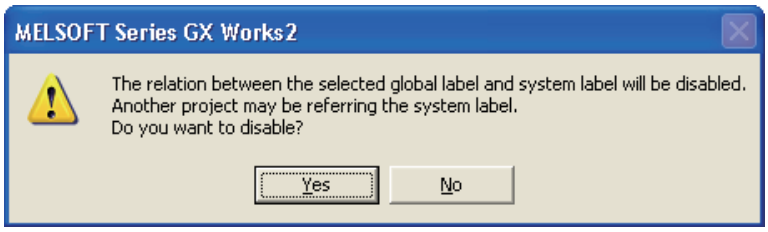
6. Click the [OK] button.

● [Release Relation] **(For FXCPU, this button is supported by FX3G, FX3U and FX3UC only)**

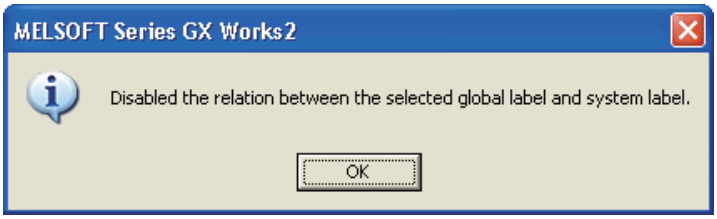
Disables the relation between a global label and system label.
After the relation with the system label is disabled, the global label becomes a normal global label.

Operation

1. Select a global label to disable its relation with a system label.
2. Click the [Release Relation] button.
3. The following message is displayed.


MELSOFT Series GX Works2
The relation between the selected global label and system label will be disabled.
Another project may be referring the system label.
Do you want to disable?
Yes
No

4. Click the [Yes] button.
5. The following message is displayed.



6. Click the [OK] button.

Point

● **Class setting**
When an item other than the class, such as a label name or data type, is set in a blank column, "VAR_GLOBAL" is automatically set for "Class". Change it if necessary.

● **Characters that can be used for label names**
Any of the following label names causes an error at compilation.
- A label name that includes a space.
- A label name that begins with a numeral.
- A label name which is same as the one used for devices. (Lower case label names can be used by setting the option. ☞ Section 10.4.4)

For details, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Common)

● **Specifying devices/addresses**
The digit-specified bit device (K4M0) or bit-specified word device (D0.1) can be specified for devices/addresses.

● **Specifying timer/counter devices**
When "Data Type" is a bit type, specified devices are treated as contacts (TS, STS, CS).
When "Data Type" is a word type, specified devices are treated as current values (TN, STN, CN).

● **Assigning devices automatically**
Devices are automatically assigned to labels which are not set devices when compiling a program. The device assignment range can be changed on the Device/Label Automatic-Assign Setting screen. (☞ Section 5.7)
The assigned devices can be checked with the cross reference function.
(☞ GX Works2 Version 1 Operating Manual (Common))

● **System label**
Devices are automatically assigned to labels which are not set devices when compiling a program. The device assignment range can be changed on the Device/Label Automatic-Assign Setting screen.
(☞ Section 5.7)
- System labels whose "Attribute" is set to "Common" are not supported by LCPU.
- System labels whose "Attribute" is set to "Common" or "Link" are not supported by FXCPU.
- Importing system labels with MELSOFT Navigator may cause an error at compilation with GX Works2.

Check the corresponding error location and correct the error as instructed by the error message displayed on the output window.

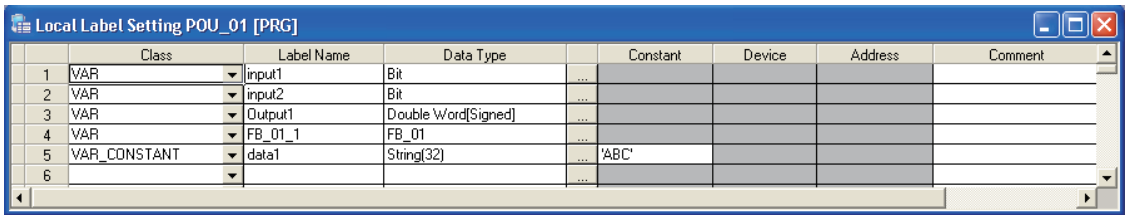
5.3 Setting Local Labels for Program Blocks

Q CPU L CPU FX

This section explains how to set local labels used for each program block.

Screen display

Select Project view ⇒ "POU" ⇒ "(program)" ⇒ "(program block)" ⇒ "Local Label".



Operating procedure

- Set the items on the screen.

Item	Description	Maximum number of characters
Class	Select a label class from the list displayed by clicking ▼. (☞ Section 5.5.1)	-
Label Name	Enter a desired label name.	Ladder/ST/SFC/ Structured ladder/FBD : 32 (FB instance name: 16)
Data Type	Specify a data type from the Data Type Selection screen displayed by clicking ... . (☞ Section 5.5.3) It can also be entered directly.	128
Constant	Enter a constant value when "VAR_CONSTANT" is selected for "Class" and simple type is selected for "Data Type".	128
Device	This item cannot be set for local labels. When the data type is Structure, click the "Detail Setting" cell and set devices on the Structure Device Setting screen. (☞ Section 5.6.3)	-
Address		
Comment*1,*2	Enter a comment. Comments can be displayed on the program editor by switching display/hide of comments. (☞ Section 8.7.5)	1024

*1: A new line can be inserted in a cell by pressing the Ctrl + Enter keys.

*2: The compilation is not needed after editing.

Point

- **Class setting**
  When an item other than the class, such as a label name or data type, is set in a blank column, "VAR" is automatically set for the "Class". Change it if necessary.
- **Characters that can be used for label names**
  Any of the following label names causes an error at compilation.
  - A label name that includes a space.
  - A label name that begins with a numeral.
  - A label name which is same name as the one used for devices. (Lower case label names can be used by setting the option. ☞ Section 10.4.4)

  For details, refer to the following manual.
  ☞ GX Works2 Version 1 Operating Manual (Common)
- **Assigning devices automatically**
  Devices are automatically assigned to labels when a program is compiled. The device assignment range can be changed on the Device/Label Automatic-Assign Setting screen. (☞ Section 5.7)
  The assigned devices can be checked with the cross reference function.
  (☞ GX Works2 Version 1 Operating Manual (Common))

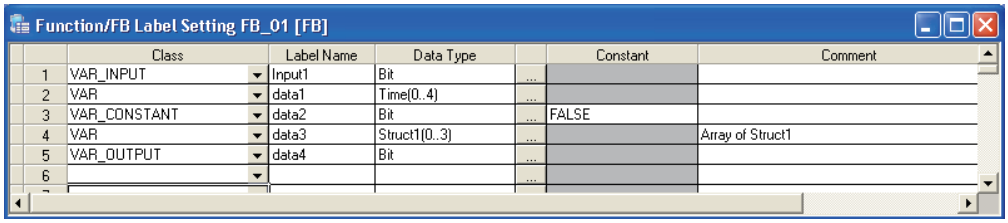
5.4 Setting Labels for Functions and Function Blocks

Q CPU L CPU FX

This section explains how to set local labels for each function or function block.
Create a new function or function block in advance.
For the method for creating new functions or function blocks, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Common)

Screen display

Select Project view ⇒ "POU" ⇒ "FB/FUN" ⇒ "(function/function block)" ⇒ "Local Label".



Operating procedure

- Set the items on the screen.

Item	Description	Maximum number of characters
Class	Select a label class from the list displayed by clicking ▼. (☞ Section 5.5.1)	-
Label Name	Enter a desired label name.	Ladder/ST/SFC/ Structured ladder/FBD : 32 (FB instance name: 16)
Data Type	Specify a data type from the Data Type Selection screen displayed by clicking [...]. (☞ Section 5.5.3) It can also be entered directly.	128
Constant	Enter a constant value when "VAR_CONSTANT" is selected for "Class" and simple type is selected for "Data Type".	128
Comment*1,*2	Enter a comment. Comments can be displayed on the program editor by switching display/hide of comments. (☞ Section 8.7.5)	1024

*1: A new line can be inserted in a cell by pressing the Ctrl + Enter keys.

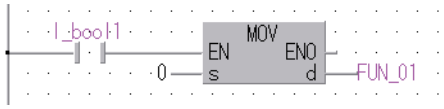
*2: The compilation is not needed after editing.

Point

- **Class setting**
  When an item other than the class, such as a label name or data type, is set in a blank column, "VAR" is automatically set for the "Class". Change it if necessary.
- **Characters that can be used for label names**
  Any of the following label names causes an error at compilation.
  - A label name that includes a space.
  - A label name that begins with a numeral.
  - A label name which is same name as the one used for devices. (Lower case label names can be used by setting the option. ☞ Section 10.4.4)

  For details, refer to the following manual.
  ☞ GX Works2 Version 1 Operating Manual (Common)
- **Assigning devices automatically**
  Devices are automatically assigned to labels when a program is compiled. The device assignment range can be changed on the Device/Label Automatic-Assign Setting screen. (☞ Section 5.7)
  The assigned devices can be checked with the cross reference function.
  (☞ GX Works2 Version 1 Operating Manual (Common))
- **Return value of function**
  VAR_OUTPUT cannot be set in a function.
  Program the function names as labels in a function to set a return value.
  Setting function names as labels is not needed. Data type set on "Result Type" can be used.

  Example: Set return value of function name "FUN_01" to 0
  <Structured ladder/FBD>



<ST>
FUN_01 := 0;

■ Maximum number of input/output labels

The maximum number of input/output labels can be used in a function/a function block differs depending on programming languages.
When setting input/output labels with local label setting of function/function block, set within the number of the input/output labels shown in the following table.

Programming language	Function	Function block	
	Input	Input	Output
Ladder language	-	1 to 24*1 (Including I/O label)	1 to 24*1 (Including I/O label)
Structured ladder/FBD or ST language	0 to 253	0 to 253 (Including I/O label)	

*1 : The I/O label is counted that each of input /output labels is one label.

5.5 Common Operations for Setting Labels

Q CPU L CPU FX

This section explains the common operations for each label setting editor.

5.5.1 Classes

Label classes indicate from which POU and how the label can be used.
Selectable labels are different according to the type of label setting editor.
The following table shows selectable labels for each label setting editor.

○: Applicable, ×: Not applicable

Class	Description	Type of usable label setting editor			
		Global label	Local label	Function	Function block
VAR_GLOBAL	A common label that can be used for program blocks and function blocks.	○	×	×	×
VAR_GLOBAL_ CONSTANT	A common label with a constant value that can be used for program blocks and function blocks.	○	×	×	×
VAR	A label that can be used for program blocks and function/function blocks.	×	○	○	○
VAR_CONSTANT	A label with a constant value that can be used for program blocks and function/function blocks.	×	○	○	○
VAR_RETAIN*1	A latch-type label that is used within the range of declared program block and function block.	×	○	×	○
VAR_INPUT	A label that is used for an input of function/ function block. Its value cannot be changed in a POU.	×	×	○	○
VAR_OUTPUT	A label that is used for an output of function block.	×	×	×	○
VAR_IN_OUT	A label that can be used for both input and output of function block with the same name. Its value can be changed in a POU.	×	×	×	○

*1: Not supported by FXCPU

5.5.2 Data types

Label data types are described in the following table.
For details such as value ranges of each data type, refer to the following manuals.
☞ MELSEC-Q/L/F Structured Programming Manual (Fundamentals)
☞ MELSEC-Q/L Programming Manual (Common Instruction)
☞ User's Manual (Function Explanation, Program Fundamentals) of the CPU module to be used.

Note that data types are different according to the programming language (ladder, SFC, ST, structured ladder/FBD).
The following table shows data types that can be used for each programming language.

○: Applicable, ×: Not applicable

Data type	Programming language	
	Ladder/SFC	ST/Structured ladder/FBD
Bit	○	○
Word (signed)	○	○
Double word (signed)	○	○
Word (unsigned)/16-bit string	×	○
Double word (unsigned)/32-bit string	×	○
Single-precision real*1	○	○
Double-precision real*2	○	○
String*3	○	○
Time	×	○
Timer	○*5	×
Counter	○*5	×
Retentive timer*4	○*5	×
Pointer	○*5	×

*1: For FXCPU, this item is supported by FX2N, FX2NC, FX3G, FX3U and FX3UC only.

*2: Supported by Universal model QCPU/LCPU only.

*3: For FXCPU, this item is supported by FX3U and FX3UC only.

*4: For FXCPU, this item is supported by FX1N, FX1NC, FX2N, FX2NC, FX3G, FX3U and FX3UC only.

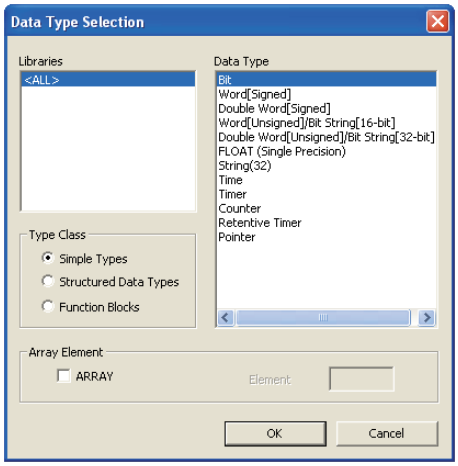
*5: For ladder language, these items cannot be used for inline structured text.

5.5.3 Selecting data types

Select a data type.
Data type can be selected on the Data Type Selection screen other than direct data entry.

Screen display

Click [...] in the data type entry field on each label setting screen.



Operating procedure

1. **Select a type in the "Type Class".**

Item	Description
Simple Types	Specify this to select a data type from basic types such as bit and word.
Structured Data Types	Specify this to select a data type from the defined structures. (Not displayed for the structured data settings)
Function Blocks	Specify this to select a data type from the defined function blocks. (Not displayed for the FB label settings/structured data settings)

2. **In the "Libraries" field, select the reference source such as the defined structure that is used as the data type.**

Item	Description
<ALL>	Browse data types and structures/function blocks defined in the project, and all libraries.
<Project>	Browse structures/function blocks defined in the project. (Not displayed when "Simple Types" is selected.)
Standard Lib.	Browse function blocks of the application functions. (Not displayed when "Simple Types" or "Structured Data Types" is selected.)

3. **In the "Data Type" field, select the data type, structure, or function block name.**

4. **Click the [OK] button when the setting is completed.**

The settings are displayed in the "Data Type" column on the label setting screen.

Point

● **Method for displaying the Data Type Selection screen**
The Data Type Selection screen can be opened by any of the following operations when [...] is in the selected status.

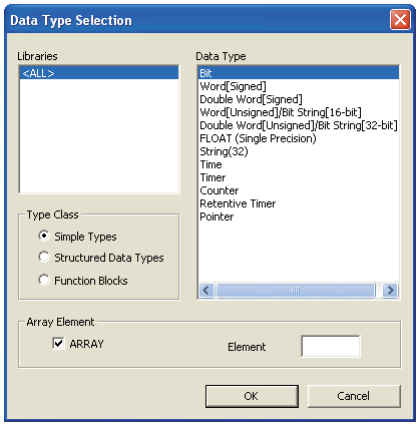
- Press the [Enter] key.
- Press the [Space] key.
- Press the [F2] key.

■ Setting arrays for data type

Define a data type as an array.
To define a data type as an array, set the items in the "Array Element" field on the Data Type Selection screen.

Operation

1. Click [...] in the data type entry field on each label setting screen.
2. Check the check box in the "Array Element" field.
3. Enter the number of elements in the "Element" field.
4. Set the data type of the array element in the same manner as setting the normal data type.



● To change the offset

To change the offset ([Array start value]..[Array end value]) to a value other than 0, edit the offset value by directly entering the array type declaration in text on each label setting screen.

	Class	Label Name	Data Type
1	VAR	data1	Bit(0..2)
2	VAR	data2	Word[Unsigned]/Bit[16Bit](1..2)
3	VAR	data3	Struct1(0..4)

● To change the array to a two- or three-dimensional array

Edit two- or three-dimensional array by directly entering the array type declaration in text on each label setting screen.

For details on array type declarations, refer to the following manual.

☞ MELSEC-Q/L/F Structured Programming Manual (Fundamentals)

	Class	Label Name	Data Type
1	VAR	data1	Bit(0..2,0..4)
2	VAR	data2	Word[Unsigned]/Bit[16Bit](0..4,0..0,1..2)
3	VAR	data3	Struct1(1..5,0..1)

Point

● **When a constant type is set for Class**
For labels whose classes are set as VAR_CONSTANT or VAR_GLOBAL_CONSTANT, arrays cannot be set for the data type. If they are set, an error occurs at compilation.

● **Offset values**
Minus values can be set for offset values.

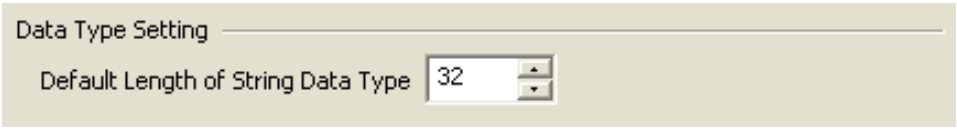
■ Setting data length of the character string data type

To change the data length of the character string data type, directly edit the data length on each label setting screen.

The data length of the character string data type is set in the option setting.

Operation

• Select [Tool] ⇒ [Options] ⇒ "Label Setting Editor" ⇒ "Default Length of String Data Type", and set the data length.



5.5.4 Editing rows

Edit rows on the label setting screen.

■ Adding rows

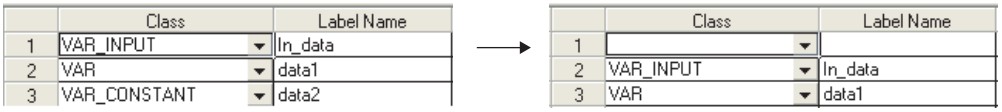
Add a row on the label setting screen.

● New Declaration (Before)

Insert a row above the selected row.

Operation

• Select [Edit] ⇒ [New Declaration (Before)] ( ).

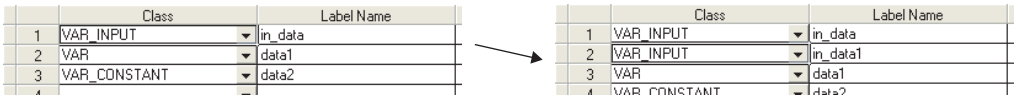


● New Declaration (After)

Insert a row below the selected row.

Operation

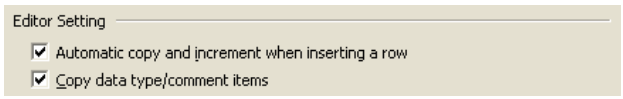
• Select [Edit] ⇒ [New Declaration (After) ( ).



Point

● **Adding rows**

The following settings can be set with the New Declaration (After) function.
Set whether to leave cells of added row blank.
Enter label names or data types automatically.
Select [Tool] ⇒ [Options] ⇒ "Label Setting Editor".



■ Deleting rows

Delete a row on the label setting screen.

Operation

• Select [Edit] ⇒ [Delete Row] ( ).

	Class	Label Name
1	VAR_INPUT	In_data
2	VAR	data1
3	VAR_CONSTANT	data2

→

	Class	Label Name
1	VAR	data1
2	VAR_CONSTANT	data2
3	VAR	data3

■ Displaying all lines or first line of comments and remarks

For the "Comment" and "Remark" columns, data can be entered in multiple lines. The 'all lines/first line display' function switches the display between all lines and only the first line by double-clicking " + " or " - ".

● All lines display

Display all lines of information in the "Comment" and "Remark" columns.

Operation

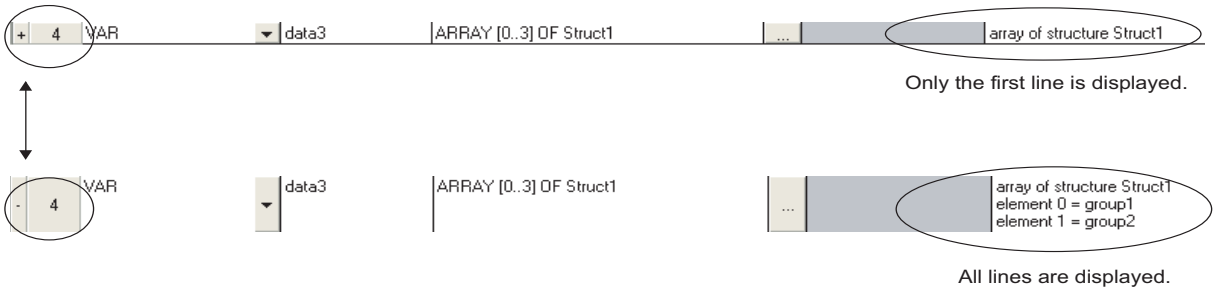
• Double-click " + " in the row number cell of the table.

● First line display

Display only the first line of information in the "Comment" and "Remark" columns.

Operation

• Double-click " - " in the row number cell of the table.

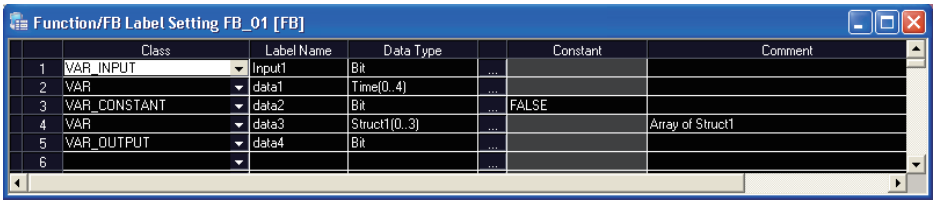


■ Selecting all rows

All rows can be selected by the following operation.

Operation

• Select [Edit] ⇒ [Select All].



5.6 Setting Structured Data Type Labels

Q CPU L CPU FX

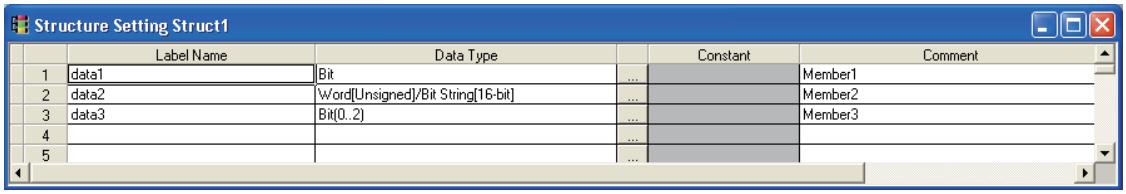
This section explains how to set structured data type labels.

5.6.1 Setting data type of structure

Set the elements of the structure on the Structure Setting screen.

Screen display

Select Project view ⇒ "POU" ⇒ "Structured Data Types" ⇒ "(structure)".



Operating procedure

- Set the items on the screen.

Item	Description	Maximum number of characters
Label Name	Enter a desired label name.	32
Data Type	Enter the data type of label which can be set on the Data Type Selection screen displayed by clicking [...]. (☞ Section 5.5.3)	128
Constant	Display the constant value of the selected type.	128
Comment	Enter comments. A new line can be inserted in a cell by pressing the Ctrl + Enter keys. To display comments on the program editor, select "Device Comment" in "Comment Display Item".	1024

Point

● **Creating new structured data**
Create structured data using the Project view.
(☞ GX Works2 Version 1 Operation Manual (Common))

5.6.2 Setting data type as structure

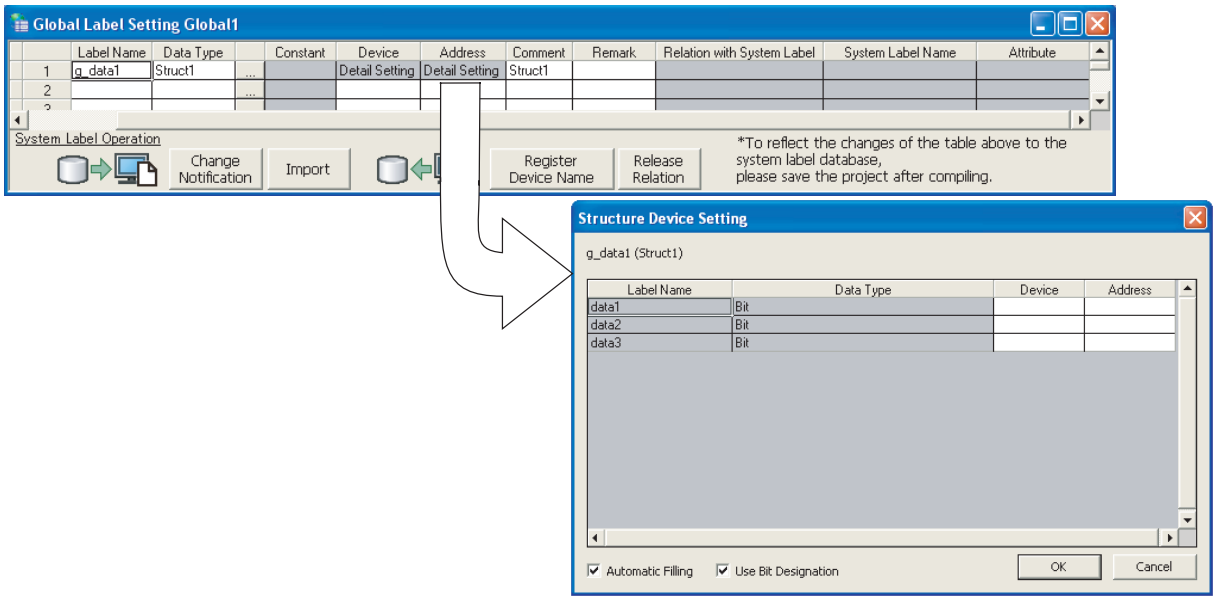
To define the data type of label as a structure, set a structure in the data type entry field on each label setting screen. In addition to direct text entry, a structure can be selected on the Data Type Selection screen (☞ Section 5.5.3).

5.6.3 Assigning devices to structured data type labels

Devices of the structured data type global labels are set on the Structure Device Setting screen.
If the structure is set for data type on the Global Label Setting screen, "Detail Setting" is displayed in the "Device" and "Address" columns. Click "Detail Setting" to display the Structure Device Setting screen.

Screen display

Click "Detail Setting" on the label setting screen.



Operating procedure

- Set the items on the screen.

Item		Description
Label Name		Display label names defined as structure.
Data Type		Display data types set to data names.
Device name	Device	Set device names to be assigned in the "Device" or "Address" column. (When a device name is entered in either column, it is displayed in the respective format automatically.)
	Address	
Automatic Filling		Check this to set devices automatically to cells in which devices are not set with the same data type.
Use Bit Designation		Check this to specify a bit device of word device.

Point

● **Display on the Local Label Setting screen**
- For the Structure Device Setting screen, the read-only screen is displayed.

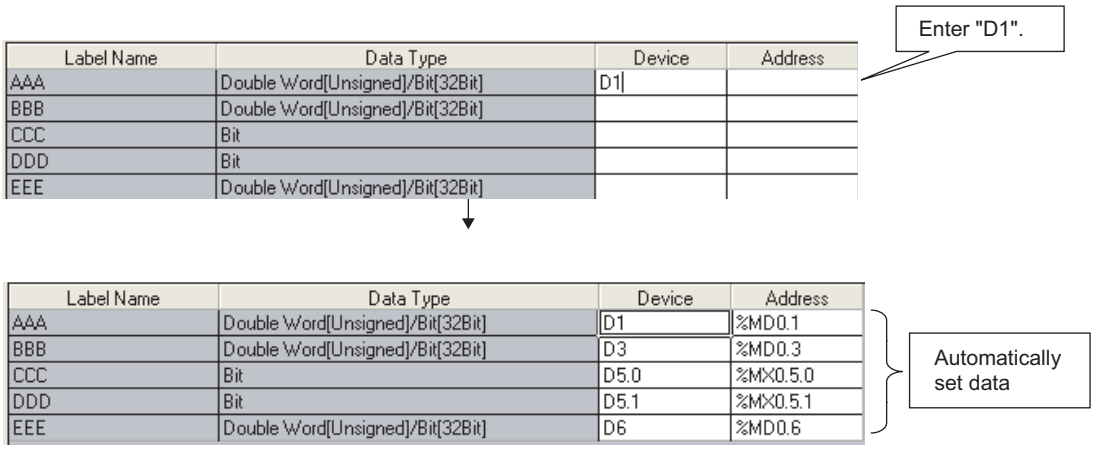
■ Entering device names automatically

The Automatic filling function can be used when setting series of devices for the same data type data on the Structure Device Setting screen.
When using the Automatic filling function, whether to use bit specification of word device can be selected.

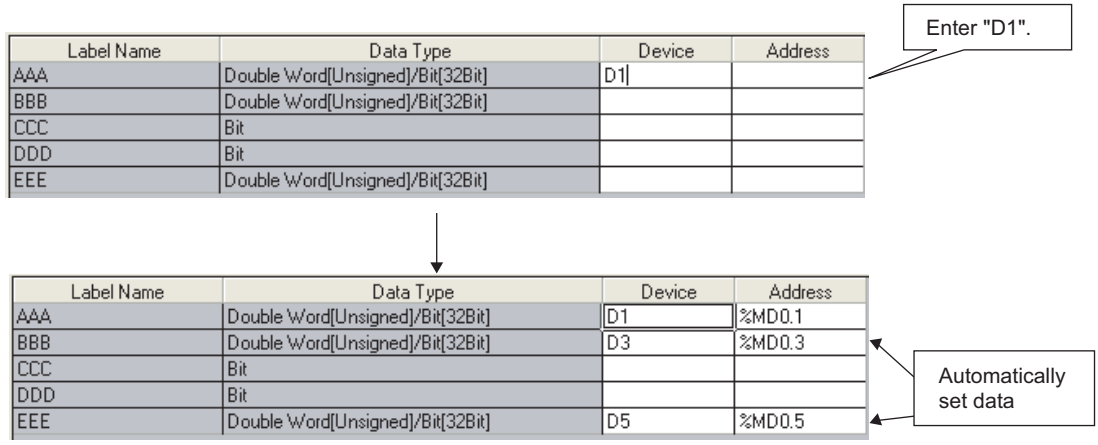
Operation

1. Click "Detail Setting" on the label setting screen.
   The Structure Device Setting screen is displayed.
2. Enter the device name to the Device/Address column.
   Series of devices are automatically set in the cells following the one entered, skipping the cells where devices are already set.

● When using bit specification



● When not using bit specification



Point

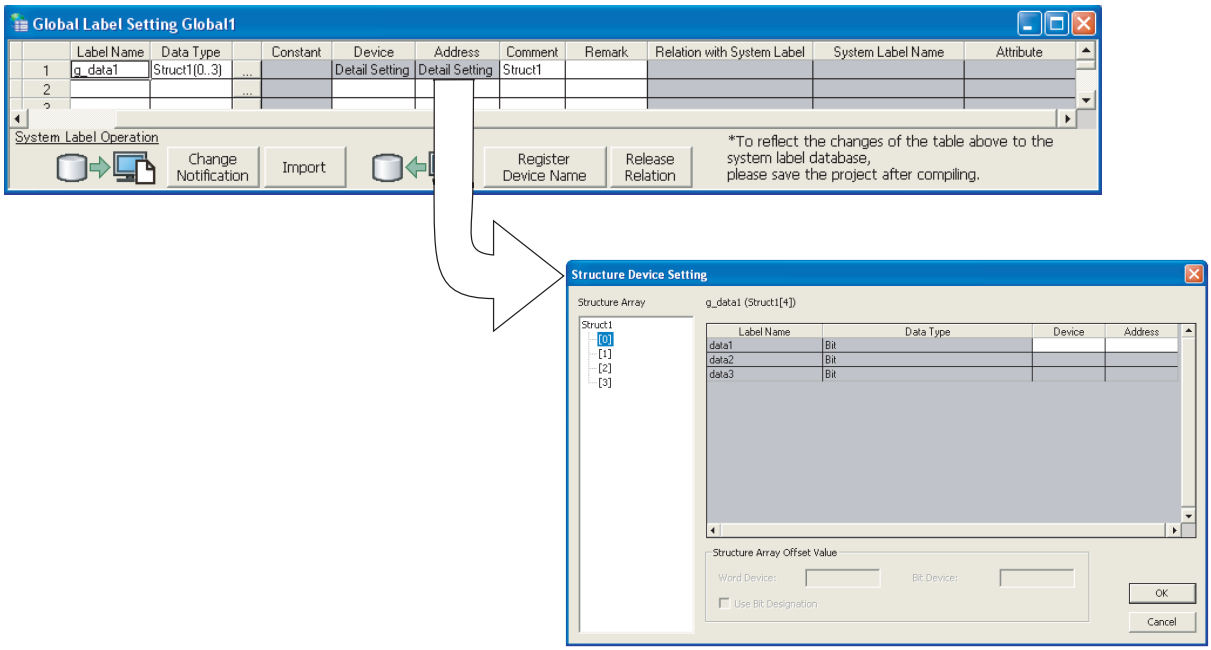
● **When not using bit specification**
- When the bit specification is not used, uncheck the "Use Bit Designation" item on the Structure Device Setting screen.

5.6.4 Assigning devices to structure array type labels

Set devices for the structure array type global labels on the Structure Device Setting screen.
When VAR_GLOBAL is set for "Class" and the structure array is set for "Data Type" on the Global Label Setting screen, "Detail Setting" is displayed in the "Device" and "Address" columns. Click "Detail Setting" to display the Structure Device setting screen.

Screen display

Click "Detail Setting" on the label setting screen.



Operating procedure

- Set the items on the screen.

Item		Description
Structure Array		Display elements of the structure array in tree format. The device setting of the element selected in the tree is displayed in the right area of the screen.
Label Name		Display label names defined as the structure.
Data Type		Display data types set to data names.
Device		Set device names to be assigned in the "Device" or "Address" column. (When a device name is entered in either column, it is displayed in the respective format automatically.) Device names can be entered for the start array element only. For the subsequent array elements, device names offset from the device number set for the start element are automatically set.
Address		
Structure Array Offset Value	Word Device/Bit Device	Specify the device offset value to be set to the same data type cells in the array element.
	Use Bit Designation	Check this to specify a bit device of word device.

Point

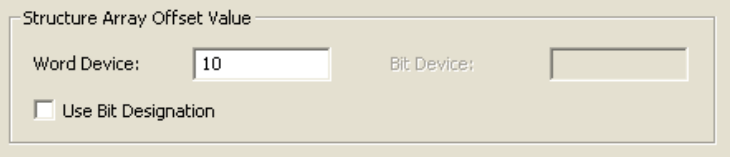
● **Display on the Local Label Setting screen**
- For the Structure Device Setting screen, the read-only screen is displayed.

■ Entering device names automatically by setting offset values

On the Structure Device setting screen, device numbers to be entered automatically can be set in fixed spacing for each array element of the structure array. Specify the difference in device numbers between the array elements as an offset value for the start device of the same data type.

Operation

1. Click "Detail Setting" on the label setting screen.
   The Structure Device Setting screen is displayed.
2. Set the "Structure Array Offset Value".



3. Set the device name for the start element data of the array.
   Devices are set to the same data type of the array elements in the screen.

・Offset value is not specified.

< Array [0] >

Label Name	Data Type	Device	Address
AAA	Double Word[Unsigned]/Bit[32Bit]	D1	%MD0.1
BBB	Double Word[Unsigned]/Bit[32Bit]	D3	%MD0.3
CCC	Bit		
DDD	Double Word[Unsigned]/Bit[32Bit]	D5	%MD0.5

Enter "D1".

< Array [1] >

Label Name	Data Type	Device	Address
AAA	Double Word[Unsigned]/Bit[32Bit]	D7	%MD0.7
BBB	Double Word[Unsigned]/Bit[32Bit]	D9	%MD0.9
CCC	Bit		
DDD	Double Word[Unsigned]/Bit[32Bit]	D11	%MD0.11

Devices starting from "D7" are assigned.

・Offset value is 10.

< Array [0] >

Label Name	Data Type	Device	Address
AAA	Double Word[Unsigned]/Bit[32Bit]	D1	%MD0.1
BBB	Double Word[Unsigned]/Bit[32Bit]	D3	%MD0.3
CCC	Bit		
DDD	Double Word[Unsigned]/Bit[32Bit]	D5	%MD0.5

Enter "D1".

< Array [1] >

Label Name	Data Type	Device	Address
AAA	Double Word[Unsigned]/Bit[32Bit]	D11	%MD0.11
BBB	Double Word[Unsigned]/Bit[32Bit]	D13	%MD0.13
CCC	Bit		
DDD	Double Word[Unsigned]/Bit[32Bit]	D15	%MD0.15

Devices starting from "D11" are assigned.

● Using bit specification

Devices can be set by specifying a bit device of word device when entering devices automatically.

Operation

1. Click "Detail Setting" on the label setting screen.
   The Structure Device Setting screen is displayed.
2. Check the "Use Bit Designation" item.
3. Set the device name for the start element data of the array.
   Devices are set to the same data type or bit device data type.

Point

● **Data for which device name can be entered**
For the structure array type, a device name can be entered only for the start element of array.
For the subsequent array elements, device names offset from the device number set for the start element are automatically set.

● **Offset values**
- An expression such as '1\2' can be specified for an incremental value of device such as U0\G0.
- When '0' is specified for the incremental value, the device number same as the data set to the start of devices is set to all data in the array.

5.7 Setting Ranges for Devices Assigned Automatically

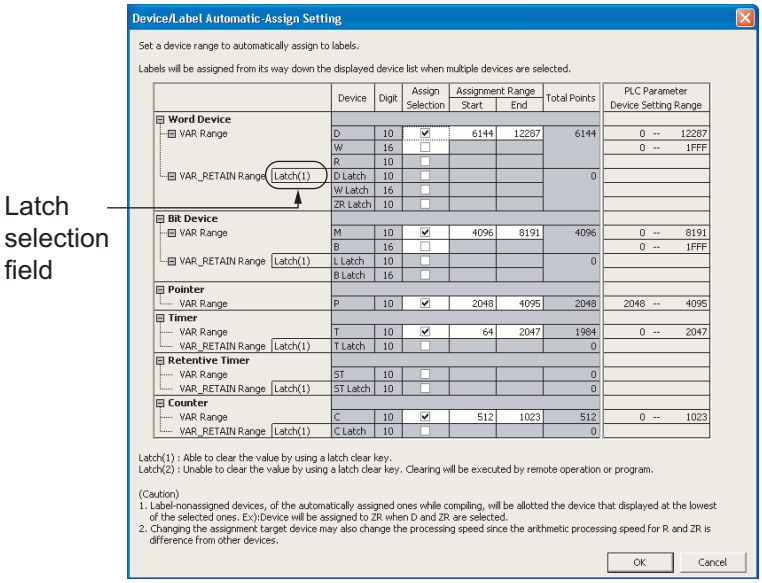
Q CPU L CPU FX

This section explains how to set the ranges for devices that are automatically assigned to labels.
The devices set as automatically assigned device are assigned to labels during compilation.
(☞ Section 10.5)

■ QCPU (Q mode)/LCPU

Screen display

Select [Tool] ⇒ [Device/Label Automatic-Assign Setting].


Latch selection field
Device/Label Automatic-Assign Setting
Set a device range to automatically assign to labels.
Labels will be assigned from its way down the displayed device list when multiple devices are selected.
Device
Digit
Assign Selection
Assignment Range
Start
End
Total Points
PLC Parameter Device Setting Range
Word Device
VAR Range
VAR_RETAIN Range
Latch(1)
Bit Device
Pointer
Timer
Retentive Timer
Counter
D
W
R
D Latch
W Latch
ZR Latch
M
B
L Latch
B Latch
P
T
T Latch
ST
ST Latch
C
C Latch
Latch(1) : Able to clear the value by using a latch clear key.
Latch(2) : Unable to clear the value by using a latch clear key. Clearing will be executed by remote operation or program.
(Caution)
1. Label-nonassigned devices, of the automatically assigned ones while compiling, will be allotted the device that displayed at the lowest of the selected ones. Ex):Device will be assigned to ZR when D and ZR are selected.
2. Changing the assignment target device may also change the processing speed since the arithmetic processing speed for R and ZR is difference from other devices.
OK
Cancel

Operating procedure

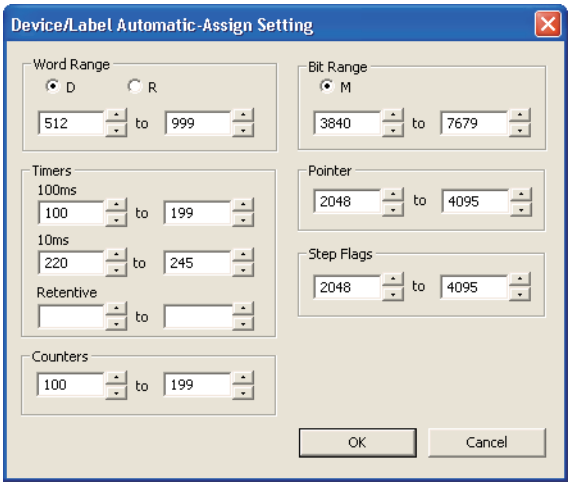
- Set the items on the screen.

Item		Description
Latch selection field		Select latch (1) or latch (2). Select when the range of latch (1), latch (2) is set on the <<Device>> tab of PLC parameters.
Device		Display the devices to be assigned automatically.
Digit		Display whether the range of device assign setting is in decimal or hexadecimal.
Assign Selection		Check the device to be assigned automatically. Multiple devices can be set.
Assignment Range	Start	Enter the range of device points to be assigned automatically.
	End	
Total Points		Display the total points of each device range for VAR and VAR_RETAIN.
PLC Parameter Device Setting Range		Display the device point range set on the <<Device>> tab of PLC parameters. When the latch range is set, display the device point range with the latch range. (Ex) When D: 0 to 12287, latch D: 5000 to 6000 are set on the <<Device>> tab of PLC parameters, display range of D: 0 to 12287, range of latch D: 5000 to 6000.

■ FXCPU

Screen display

Select [Tool] ⇒ [Device/Label Automatic-Assign Setting].



Operating procedure

- Select the device type, and set the start and end addresses to be assigned automatically.

5.7.1 Precautions on automatically assigned devices

● Precautions when changing automatically assigned devices

All programs need to be compiled when the range of automatically assigned device is changed. Compiling all programs changes the device assignment to labels. Therefore, device values set before the program change remain on the device-assigned labels.
For QCPU (Q mode)/LCPU, reset the programmable controller CPU, clear all device memories including latches, clear all file registers, then switch the programmable controller to RUN for a precautionary measure.
(☞ GX Works2 Version 1 Operating Manual (Common))
For precautions on compiling all programs, refer to Section 10.5.3.

● Assigning device with Device/Label Automatic-Assign Setting

Assign the devices to labels with the Device/Label Automatic-Assign Setting during compilation. For details, refer to Section 10.5.
The assigned devices can be checked with the cross reference function.
(☞ GX Works2 Version 1 Operating Manual (Common))
Devices within the range set on the Device/Label Automatic-Assign Setting screen cannot be used in a program.

● Precautions when the multiple types of devices are assigned automatically (QCPU (Q mode)/LCPU)

Refer to Precautions on compilation. (☞ Section 10.5.3)

● Device types and setting ranges

The types of automatically assigned devices differ by the type of CPU.
The setting ranges depend on the number of device points set in PLC parameter.
For details of PLC parameter, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Common)

● Precautions when displaying the Device/Label Automatic-Assign Setting screen

When displaying the Device/Label Automatic-Assign Setting screen, an error message may be displayed.
In this case, terminate GX Works2, copy "vsflex8n.ocx" stored in the folder of GX Works2 installation destination to "C:\WINDOWS\system32" (for Windows XP), and restart GX Works2.

5.8 Writing/Reading Data to/from CSV Files

Q CPU L CPU FX

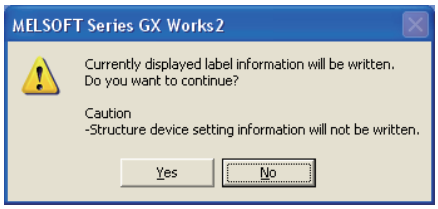
This section explains how to write the label setting data to the CSV file and how to read the label setting data from the CSV file.

■ Writing label setting data

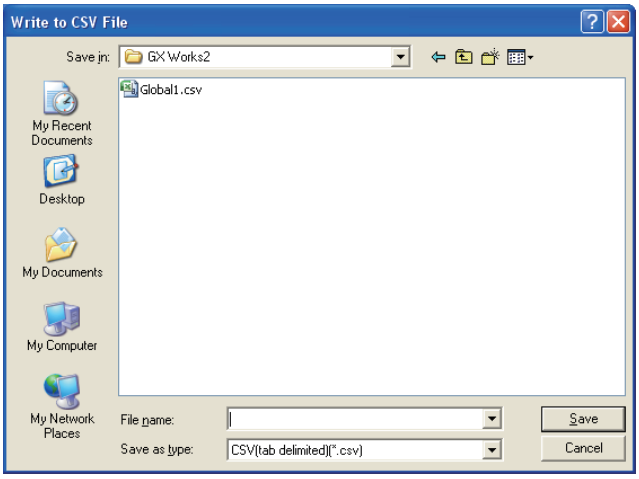
Write label setting data to CSV files.

Operating procedure

1. **Select [Edit] ⇒ [Write to CSV File] ( ).**
   The following message is displayed.



2. **Click the Yes button.**
   The Write to CSV File screen is displayed.



3. **Enter the file name to be saved and click the Save button.**
   The label setting data is saved in the save destination.

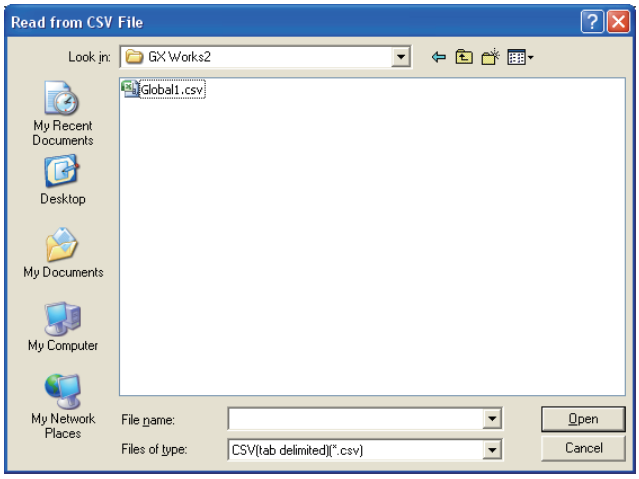
■ Reading label setting data

Read label setting data from CSV files.

Operating procedure

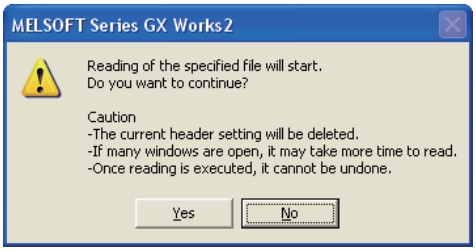
1. **Select [Edit] ⇒ [Read from CSV File] ( ).**

   The Read from CSV File screen is displayed.



2. **Select the file name to be read and click the Open button.**

   The following message is displayed.


MELSOFT Series GX Works2
Reading of the specified file will start.
Do you want to continue?
Caution
-The current header setting will be deleted.
-If many windows are open, it may take more time to read.
-Once reading is executed, it cannot be undone.
Yes
No

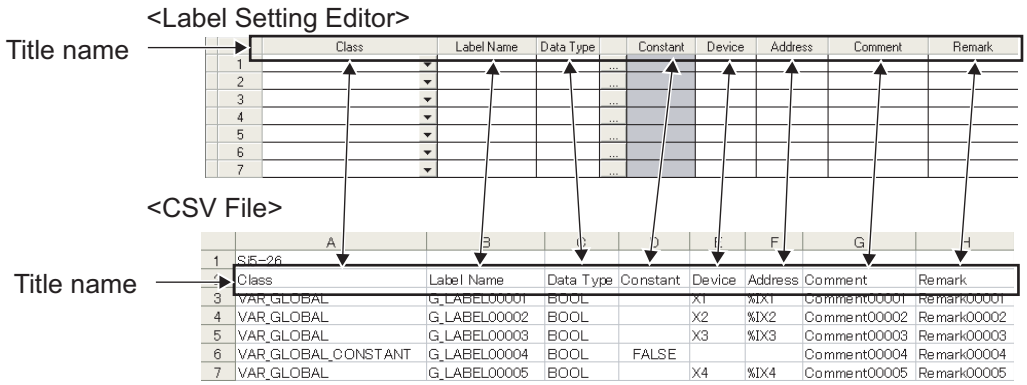
3. **Click the Yes button.**

   The label setting data is read to the project.

■ CSV file format

The title name of Label Setting Editor links with the title name of the CSV file.

- Data of column which coincides in the title name of Label Setting Editor in the CSV file is read to Label Setting Editor.
- Data of column which does not coincide in the title name of Label Setting Editor cannot be read to the CSV file.
- Columns order of the CSV file can be read even if it does not coincide in the columns order of Label Setting Editor.



Restrictions

● **When multi-byte characters are used in the label name**
Do not use multi-byte characters in a label name when using a CSV file created in Japanese version of GX Works2 in other language version of GX Works2.
For GX Works2 with the language version other than Japanese, this function supports multi-byte characters, however, the compilation function does not support multi-byte characters. Therefore, the program cannot be compiled properly when multi-byte characters are used in a label name.

MEMO

6 COMMON OPERATIONS OF PROGRAM EDITORS

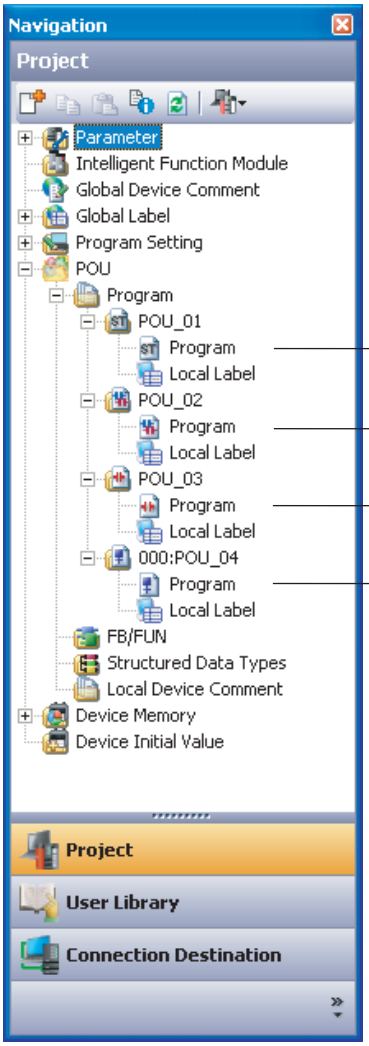
This chapter explains the common operations of program editors used to edit sequence programs.

6.1 Types of Program Editor 6-2
6.2 Common Operations of Program Editors 6-5

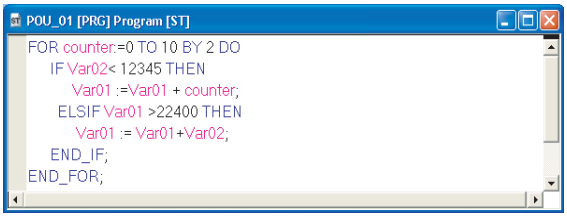
6.1 Types of Program Editor

Q CPU L CPU FX

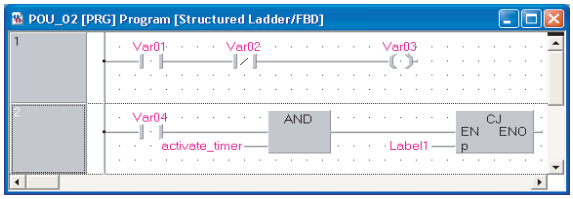
This section explains how to edit programs according to the programming language.



ST editor (☞ Chapter 7)



Structured ladder/FBD editor (☞ Chapter 8)



Ladder editor

For the operating method of the ladder editor, refer to the following manual.

☞ GX Works2 Version 1 Operating Manual (Simple Project)

SFC editor

For the operating method of the SFC editor, refer to the following manual.

☞ GX Works2 Version 1 Operating Manual (Simple Project)

Point

● **Creating new program data**
Program data are created in the project view. (☞ GX Works2 Version 1 Operating Manual (Common))
Program data are created paired with a label editor when a new POU is created.

6.1.1 Available programming languages

The following table shows the programming languages that can be used for each POU.

○: Available ×: Not available

POU	Programming language			
	ST	Structured ladder/FBD	Ladder*1	SFC*1
Functions	○	○	×	×
Function blocks	○	○	○	×
Program blocks	○	○	○	○

*1: Not supported by FXCPU.

Point

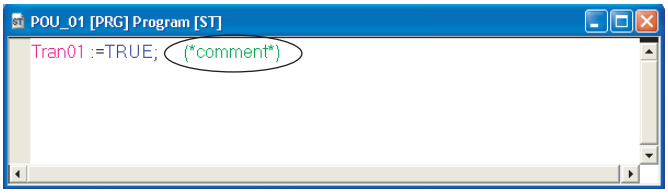
● **Changing programming languages**
- Select a programming language when creating a new POU.
  For creating a new data, refer to the following manual.
  ☞ GX Works2 Version 1 Operating Manual (Common)
- The programming language that is selected when creating a program, cannot be changed later.
  To change to another programming language, create a new POU.

6.1.2 Available comment formats

The following explains a comments that can be used for each program editor.

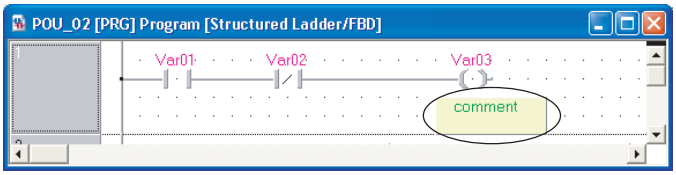
■ Comments on the ST editor

On the ST editor, comments are enclosed by '(*' and '*)'.

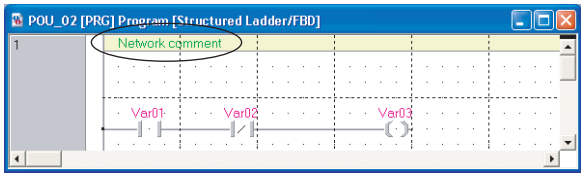


■ Comments on the structured ladder/FBD editor

On the structured ladder/FBD editor, comments can be pasted anywhere in the same manner as ladder symbols.
(☞ Section 8.9)

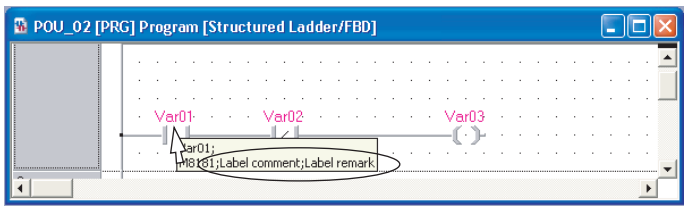


In the Guided mode, comments can be added at the start of a ladder block.
(☞ Section 8.10.9)



■ Label comments

Label comments and remarks set at label setting can be displayed on tool hints.
(☞ Section 6.2.8)



6.2 Common Operations of Program Editors

Q CPU L CPU FX

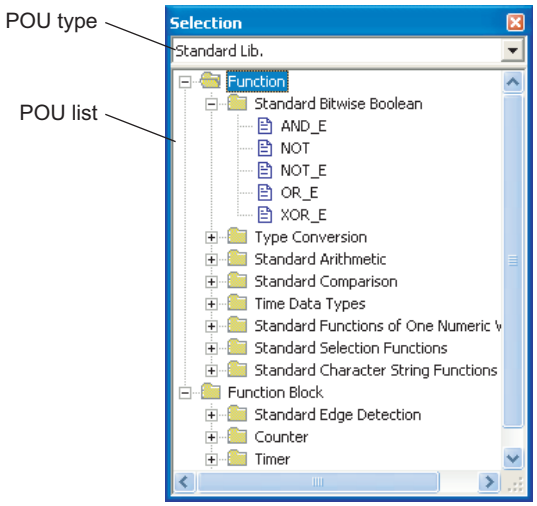
This section explains the common operations of program editors (ST editor and structured ladder/FBD editor). The operating method when using a structured ladder/FBD editor is explained in this section.

6.2.1 Using POUs (Function Block Selection window)

Select POUs such as functions or function blocks from the Function Block Selection window and utilize them to the program.

Screen display

Select [View] ⇒ [Docking Window] ⇒ [Function Block Selection Window] ( ).



Screen display

Item		Description
POU type		Display POUs in categories.
	All Parts	Display functions/function blocks and operators.
	Application Instruction	Display functions/function blocks of application functions.
	(Instructions)*1	Display common instructions, application instructions, and special instructions.
	(User library name)	Display functions defined in the user library.
	Project	Display functions/function blocks defined in FB/FUN.
	Operator	Display operators.
POU list		Display POUs of the type selected for 'POU type'.
	Function*2	Display functions.
	Function block*2	Display function blocks.
	Operator*2	Display operators.

*1: For FXCPU, basic instructions and application instructions are displayed.

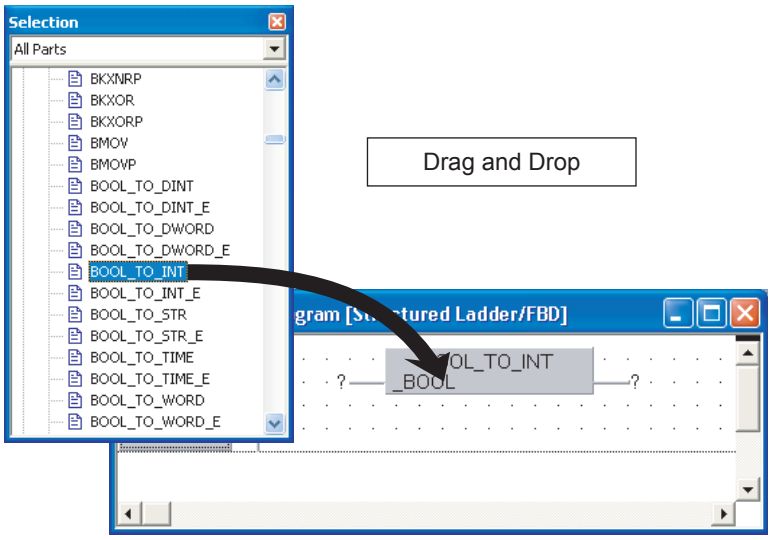
*2: For details of functions/function blocks/operators, refer to the following manual.

(☞ MELSEC-Q/L/F Structured Programming Manual (Fundamentals))

Operating procedure

1. **Select a POU to be used from the 'POU list'.**

2. **Drag & drop the selected POU to the program editor.**



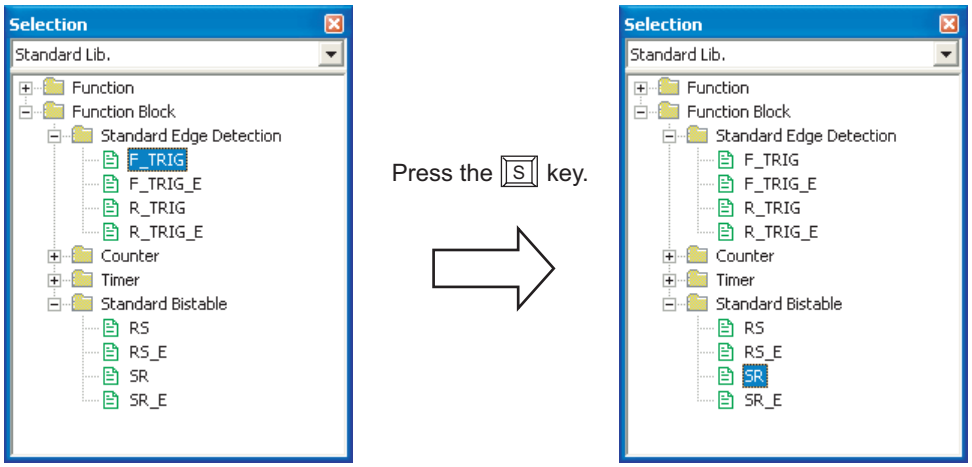
■ Searching for a POU name by its initial letter

Search for a particular item among those displayed on the POU list tree by its initial letter.

Operating procedure

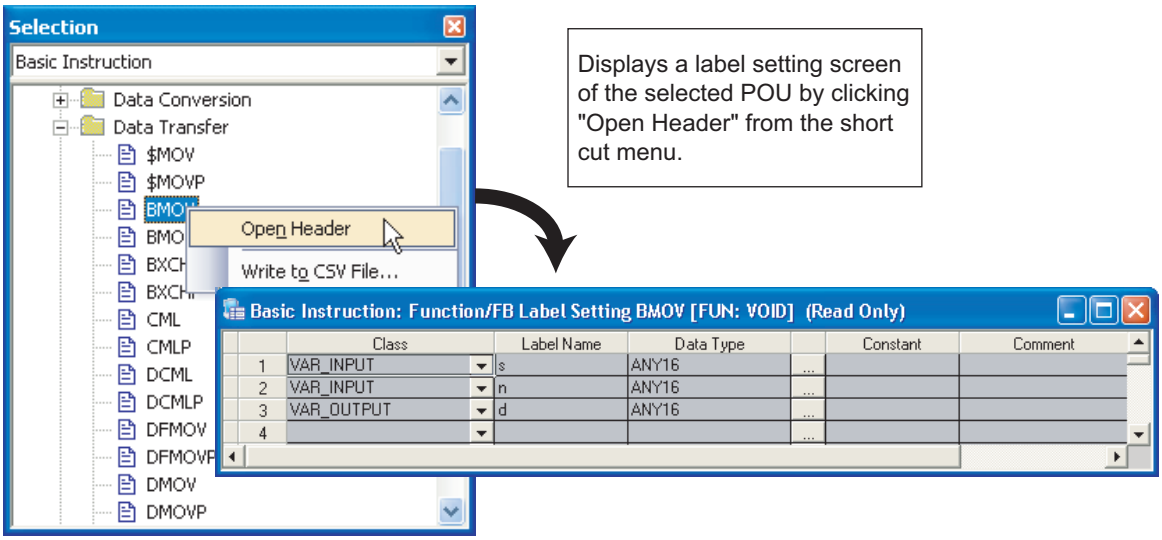
- In the POU list field, enter the initial letter of the POU to be searched for.

  The cursor moves to the entered initial letter of the POU.
  If there is no POU with the entered initial letter, the selection status does not change.



■ Displaying label settings

Display a label setting screen by right-clicking a function or function block.



Point

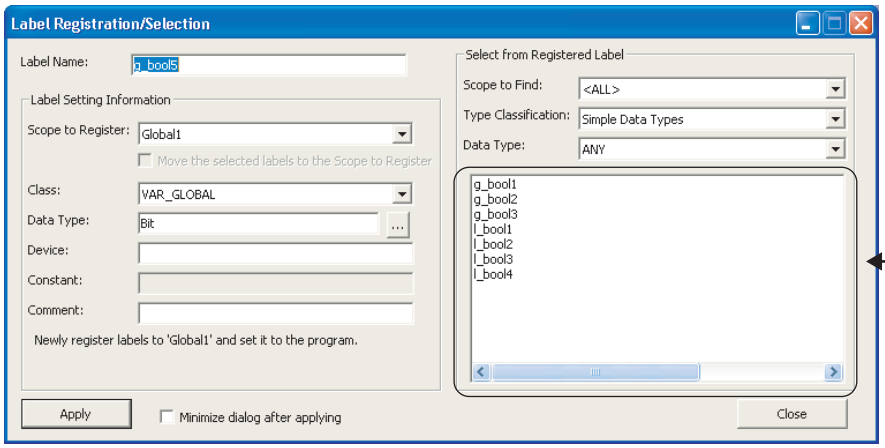
- **Operators**
  Since label settings are not available for operators, short cut menu is not displayed.

6.2.2 Using labels in the program

Enter preset labels to program editor. A new label can also be registered.

Screen display

Select [Edit] ⇒ [List Operands] ( ).



Point

● **Display setting for Label Registration/Selection screen**
For a structured ladder/FBD program, the Label Registration/Selection screen can be displayed when inserting an undefined label by setting the option below.
Select "Declare new label name" under [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "Label".

■ Entering registered labels

Select and enter the registered labels on the Label Registration/Selection screen.
Register labels with label setting editor (☞ Chapter 5) or on the Label Registration/Selection screen (☞ Registering new labels).

Operating procedure

1. **Select the argument to which a label is entered on a program editor.**

2. **Select [Edit] ⇒ [List Operands] ( ).**
The Label Registration/Selection screen is displayed.

3. Set the items on the screen.

item		Description
Select from Registered Label		-
	Scope to Find	Select a label setting editor's name of the search destination.
	Type Classification	Select a type classification of data type. (☞ Section 5.5.3)
	Data Type	Select a data type.
	Registered label list	Display a list of labels existing in the label setting editor of the search destination. Select a label to be entered.
Minimize dialog after applying		After clicking the Set button, check this to minimize the Label Registration/Selection screen.

4. Click the Set button.

The selected label is applied to the program editor.

■ Registering new labels

Select and enter the new labels on the Label Registration/Selection screen.

Operating procedure

1. Select the argument to which a label is entered on a program editor.

2. Select [Edit] ⇒ [List Operands] ( ).

The Label Registration/Selection screen is displayed.

3. Set the items on the screen.

item		Description
Label Name		Enter a label name.
Label Setting Information		-
	Scope to Register	Select a label setting editor's name of registering destination.
	Class	Select a class name of label from the list displayed by clicking ▼. (☞ Section 5.5.1)
	Data Type	Set a data type from the Data Type Selection screen displayed by clicking ... (☞ Section 5.5.3) It can also be entered directly.
	Device	Set a device to be assigned to the label when "VAR_GLOBAL" is selected for "Class". • When the "Device" column is blank, a device is automatically assigned.
	Constant	Enter a constant value when "VAR_GLOBAL_CONSTANT" or "VAR_CONSTANT" is selected for "Class", and simple type is selected for "Data Type".
	Comment	Enter a label comment. Comments can be displayed on the program editor by switching display/hide of comments. (☞ Section 8.7.5) A new line cannot be inserted. Edit a comment with a label setting editor to insert a new line.
Minimize dialog after applying		After clicking the Set button, check to minimize the Label Registration/Selection screen.

4. **Click the Set button.**

   The label is registered and applied to the program editor.

■ Changing registered label settings

Change the settings of registered labels on the Label Registration/Selection screen.
Label setting editor and data type of registered label can be changed.

Operating procedure

1. **Select [Edit] ⇒ [List Operands] ( ).**

   The Label Registration/Selection screen is displayed.

2. **Select the label from "Registered Label List".**

   For items of "Select from Registered Label", refer to "Entering registered labels".

3. **Change the settings on "Label Setting Information".**

   For items of "Label Setting Information", refer to "Registering new labels"

4. **For changing the label setting editor, check "Move the selected labels to the Scope to Register".**

5. **Click the Set button.**

   The label settings are changed.

6.2.3 Undo and redo

Undo and redo the previous editing status.

■ Undo

Operating procedure

- Select [Edit] ⇒ [Undo] ( ) after editing the ladder.
  The previous editing status is restored.

■ Redo

Operating procedure

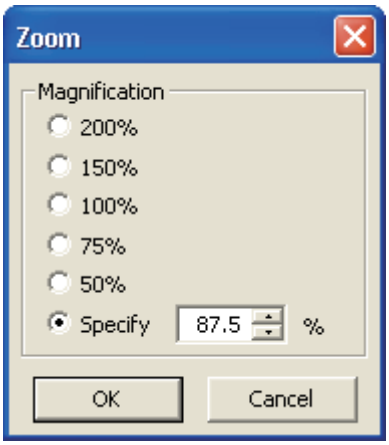
- Select [Edit] ⇒ [Redo] ( ) after performing [Undo].
  The operation deleted by clicking the [Undo] button is restored.

6.2.4 Changing display size of editing screen

Change the display size of editing screen.

Screen display

Select [View] ⇒ [Zoom] ⇒ [Set Zoom Factor].



Operating procedure

• Set the items on the screen.

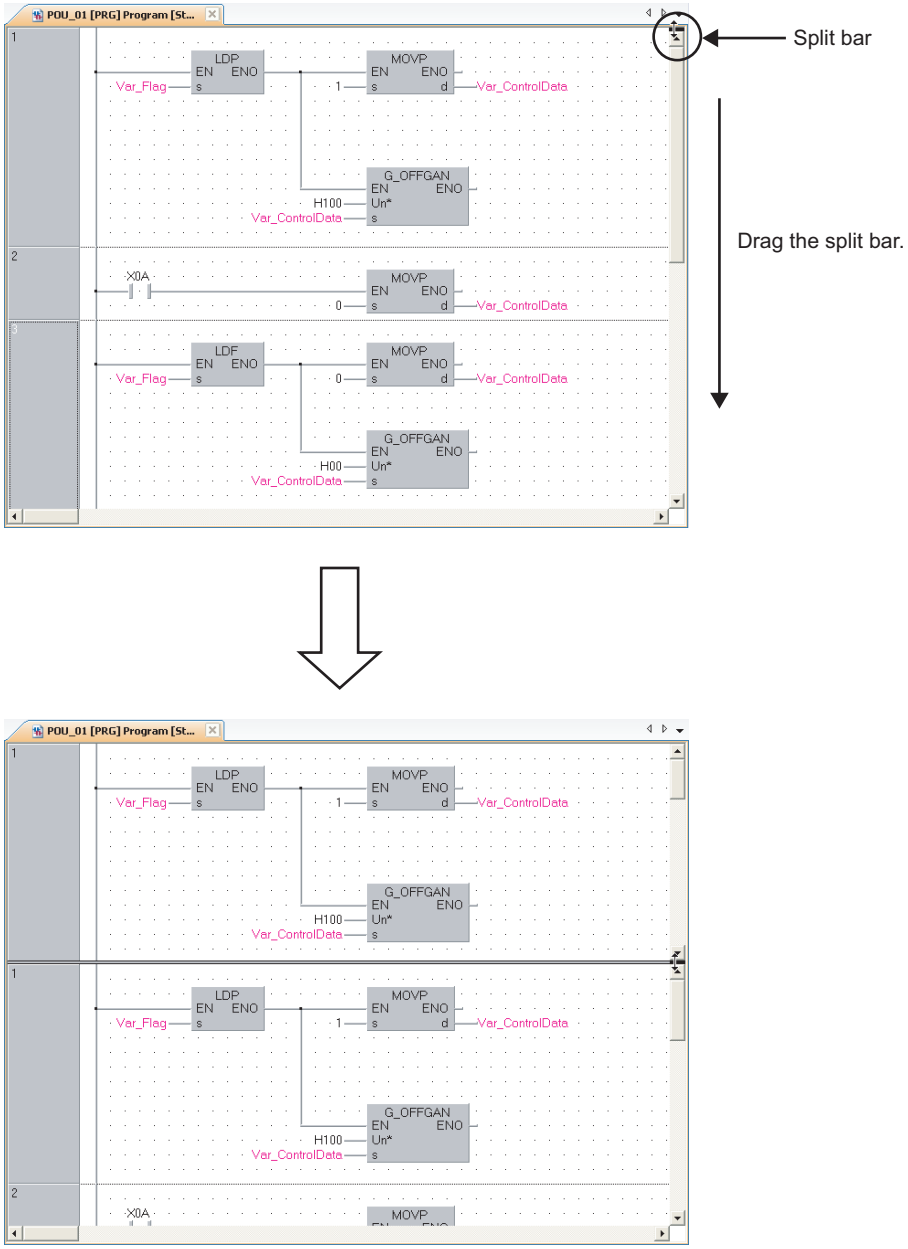
Item	Description
200%, 150%, 100%, 75%, 50%	Change the display size of editing screen with a selected magnification.
Specify	Set a magnification specified by every 12.5%.

6.2.5 Splitting editing screen

Split the editing screen one above the other.

Operating procedure

- Drag the split bar on the scroll bar of the editing screen.

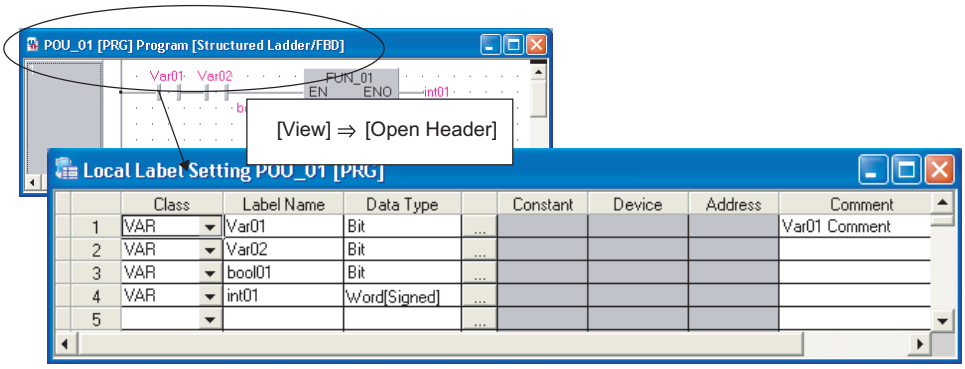


6.2.6 Opening label setting screen of program editor being edited

Display the Local label Setting screen of the program editor being edited.

Operating procedure

- Select [View] ⇒ [Open Header].



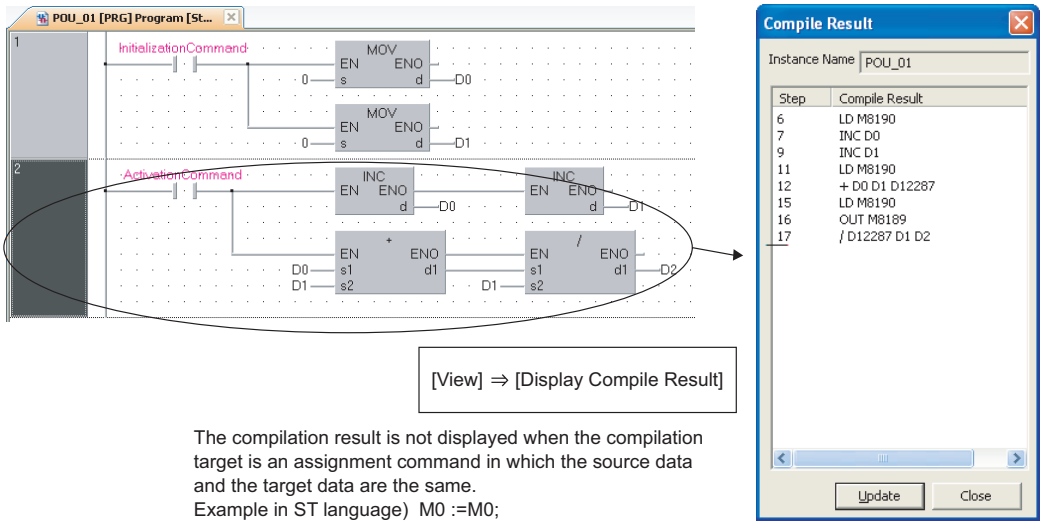
6.2.7 Displaying compilation result in list form

Display a compiled program in a list format.
A selected ladder block for structured ladder/FBD or a whole editor currently opened for ST is the compilation target.

Operating procedure

1. **For structured ladder/FBD, select a ladder block.**

2. **Select [View] ⇒ [Display Compile Result].**



The compilation result is not displayed when the compilation target is an assignment command in which the source data and the target data are the same.
Example in ST language) M0 :=M0;

Point

- Precautions on FXCPU
  For FXCPU, when a block password with the validated setting for "Read-protect the execution program" exists, the compilation result cannot be displayed.

6.2.8 Setting display contents of tool hint

Content defined on the label setting screen as tool hints is displayed by placing the cursor on a label name on the program editor.

The contents excluding label names displayed on the tool hints can be set by the following operation.

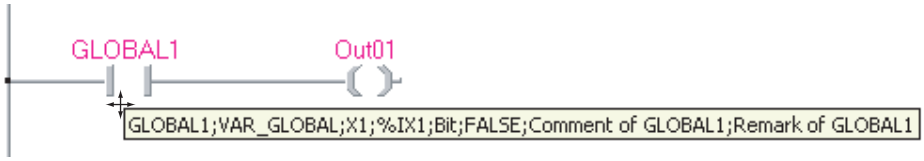
Operating procedure

1. **Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD/ST" ⇒ "Tool Hint".**

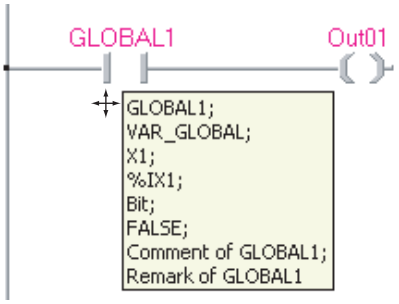
2. **Set the following items:**

Item		Description	Example
Tool Hint Display Items	Monitored Value	Display a monitoring result. When the labels are used for array element, or when the elements are not specified for array or structured data type, the monitoring values are not displayed.	(Displayed only during monitoring)
	Class	Display a label class.	VAR_GLOBAL
	Device	Display a device assigned to the label in the device format.	X1
	Address	Display a device assigned to the label in the address format.	%IX1
	Data Type	Display a data type of the label.	Bit
	Constant Value	Display a constant value of the label.	FALSE
	Comment	Display label comments.	GLOBAL1 comment
	Remark	Display a remark of the global label.	GLOBAL1 remark
Tool Hint Display Format	Single Line	Display tool tips in a single line.	
	Multi Line	Display tool tips in multiple lines.	

<Single line>



<Multiple lines>



6.2.9 Opening label setting and program screens for selected POU

Display label settings or a program of the function or function block selected on the program editor.

■ Displaying a label setting screen

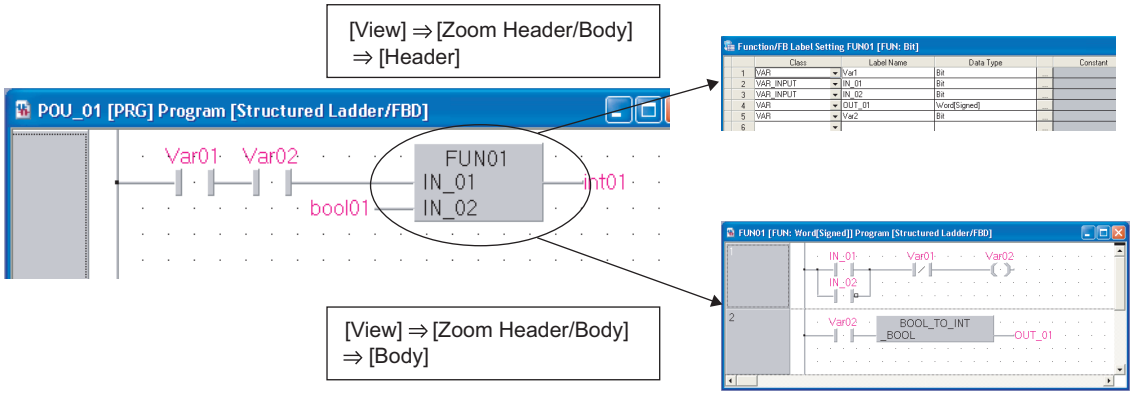
Operation

- Select [View] ⇒ [Zoom Header/Body] ⇒ [Header].

■ Displaying a program editor

Operation

- Select [View] ⇒ [Zoom Header/Body] ⇒ [Body].



Point

● **Displaying by double-clicking the function or function block**
For a structured ladder/FBD program, a label editor or program editor can be opened by double-clicking POU.
Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "FB/FUN" and set "Double clicking opens header" or "Double clicking opens body".

7 EDITING ST PROGRAMS

This chapter explains the functions of ST editor to edit ST programs.

7.1 ST Editor 7-2

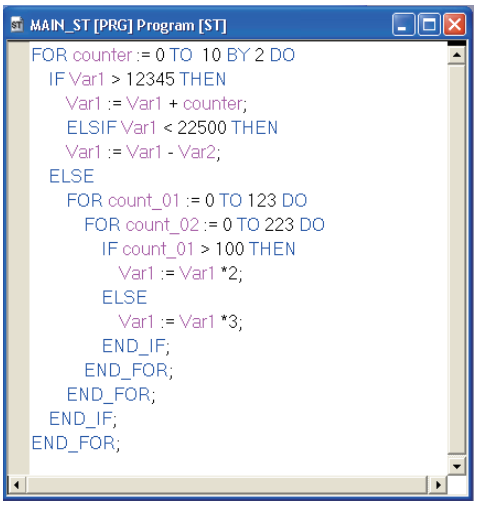
7.1 ST Editor

Q CPU L CPU FX

This section explains how to edit programs on the ST editor.
The ST editor is a language editor in text format for creating programs in the ST language.
The operating method is the same as that of general text editor. Spaces, tabs and line feeds can be entered between keywords and variable names of the ST control syntax.

Screen display

Select Project view ⇒ "POU" ⇒ "Program" ⇒ "(program)" ⇒ "Program".

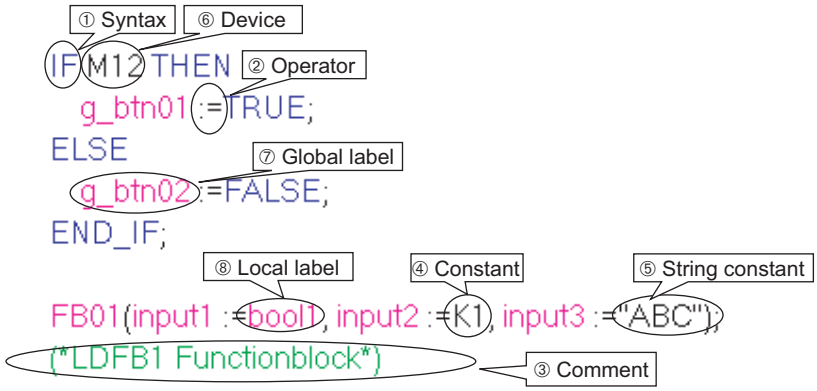


Point

● **Display colors**

On the ST editor, the following display colors can be specified by selecting [View] ⇒ [Color and Font].
The colors in the parentheses indicate the default colors.

① Syntax (Blue)
② Operator (Black)
③ Comment (Dark green)
④ Constant (Black)
⑤ String constant (Black)
⑥ Device (Black)
⑦ Global label (Magenta)
⑧ Local label (Magenta)



For details, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Common)

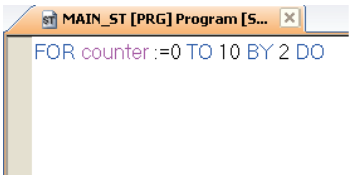
7.1.1 Writing ST programs

Write a ST program.
For functions/instructions used for ST program, refer to the structured programming manuals.

Operating procedure

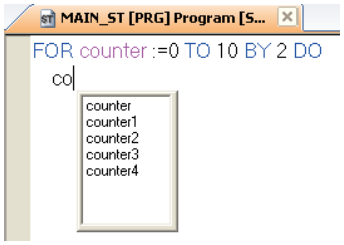
- Write a program in the text format using a keyboard.

  The colors of defined labels, devices, syntaxes, operators, constants, string constants, and comments change when they are entered.
  Syntaxes entered in lower-case characters are automatically changed to upper-case characters.



Point

● **Options of labels displayed while typing a label**
Labels match to the entered characters are displayed while typing a label. If only one option is available, it is entered automatically.
Global labels and local labels of corresponding POU are displayed.



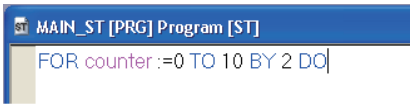
● **Entering assignment operators**
Press the Ctrl + Shift + = keys to enter an assignment operator (:=).

7.1.2 Automatic indention

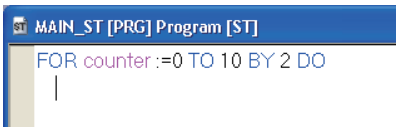
Insert a tab as the indention at the head of a new line automatically when a line feed is inserted during program editing.
The indention can be set in the option setting.

Operating procedure

1. **Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "ST".**



2. **Select "Auto Indention".**



3. **Enter the ST control statement to the ST editor (such as a FOR statement).**
   When a line feed is inserted, the next line is indented based on the content of the statement.

7.1.3 Setting tab length

Set a tab length in the option setting.

Operating procedure

1. **Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "ST".**

2. **Set the "Tabulator Length".**

7.1.4 Using templates

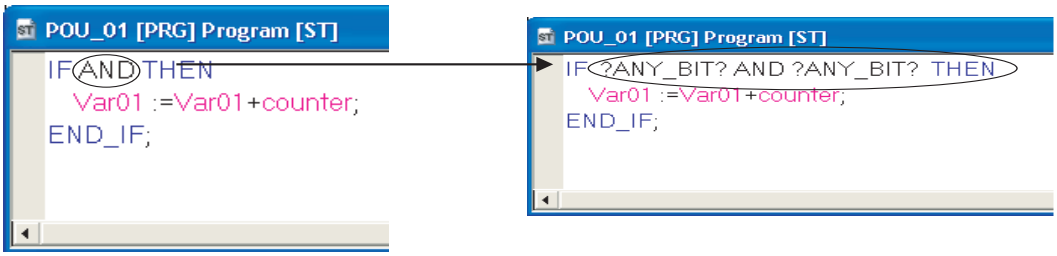
Insert templates correspond to the instructions/functions/control syntaxes on the ST editor.
A template of argument is inserted when an instruction or function is entered from the Function Block Selection window by the drag and drop operation.
A template is an argument data type defined for each instruction/function or a format of control syntax.
For details of data types and formats displayed in the templates, refer to the following manual.
☞ MELSEC-Q/L/F Structured Programming Manual (Fundamentals)

Operating procedure

1. **Move the cursor to the instruction/function/control syntax entered to the ST editor.**

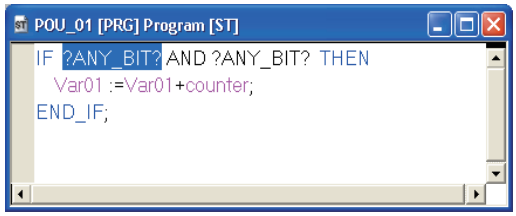
2. **Select [Edit] ⇒ [Display Template] ( ).**
   A template is inserted.

3. **Enter variables according to the inserted template.**
   Delete the data type name enclosed by "?", and enter a label name or device that is equivalent to the data type.



Point

- **Inserting templates**
  A template can also be inserted by right-clicking the instruction/function/control syntax entered to the ST editor and selecting [Display Template] ( ) from the shortcut menu.
- **Editing arguments**
  Select [Edit] ⇒ [Mark Template (Left)] ( )/[Mark Template (Right)] ( ), or press Ctrl + Alt + / keys to set an argument of the template in the selected status one by one.



MEMO

8 EDITING STRUCTURED LADDER/FBD PROGRAMS

This chapter explains the functions of program editor to edit structured ladder/FBD programs.

8.1 Creating Ladder/FBD Programs 8-2
8.2 Editing in Select Mode 8-4
8.3 Drawing Lines 8-7
8.4 Operating Ladder Symbols 8-11
8.5 Changing Type of Contact and Coil 8-15
8.6 Operating Functions and Function Blocks 8-18
8.7 Changing Display Format of Variables 8-21
8.8 Editing Ladder Blocks 8-26
8.9 Editing Comments 8-32
8.10 Editing in Guided Mode 8-34
8.11 Checking Wrapping Position for Printing 8-39

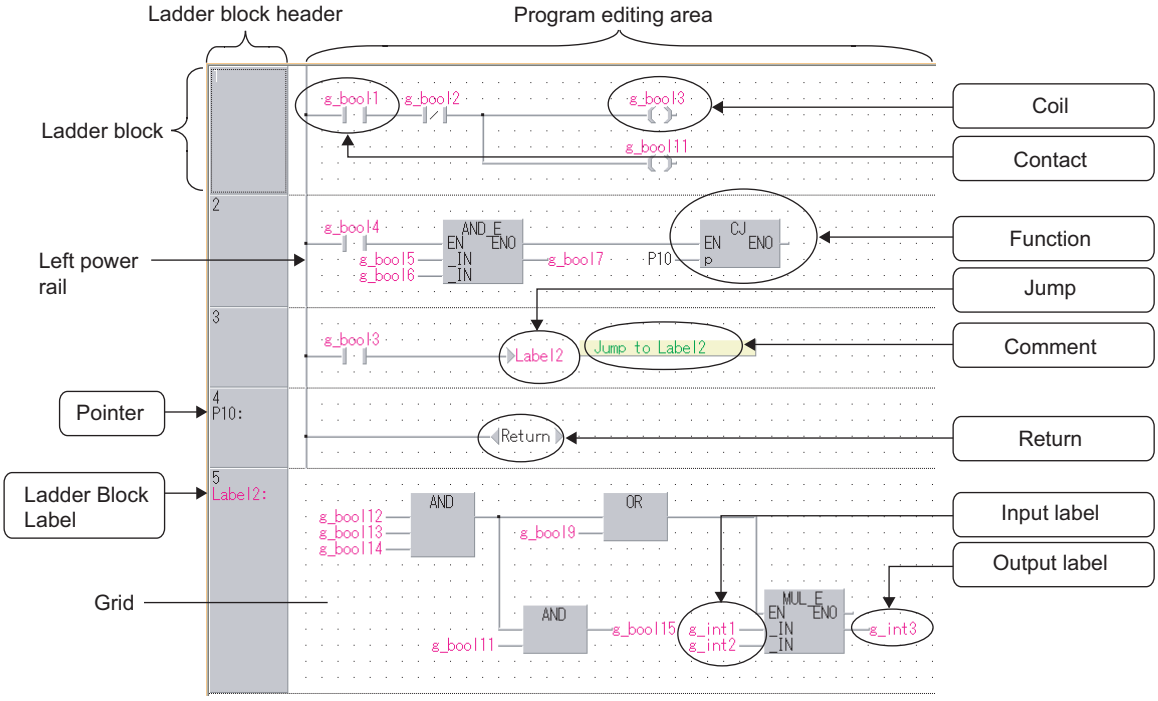
8.1 Creating Ladder/FBD Programs

Q CPU L CPU FX

This section explains how to create ladder programs and functions for creating ladder programs on the structured ladder/FBD editor.
The structured ladder/FBD editor is a language editor in graphic format for creating programs in the structured ladder/FBD language.
Ladder symbols such as contacts, coils, and functions/function blocks are used to create structured ladder/FBD programs. Each ladder symbol is connected with a line.
The suitable editing mode can be selected according to the program entry method and editing target. (☞ Section 8.1.1)

Screen display

Select Project view ⇒ "POU" ⇒ "Program" ⇒ "(program)" ⇒ "Program".



Display contents

Name	Description	Reference
Ladder block	A unit for creating a program A ladder block consists of a ladder block header and a program editing area.	Section 8.8
Ladder block header	Display information such as a title set for each ladder block, and a label name of the jump target.	Section 8.8.4
Program editing area	An area for creating a program. Ladder symbols can be placed in the grid area.	Section 8.1
Left power rail	A start position of the structured ladder program. For FBD, the display of left power rail can be switched to hide.	Section 8.8.7
Grid	Indicate specific positions of tab stop and start/end positions of lines.	Section 8.8.8

8.1.1 Selecting editing modes

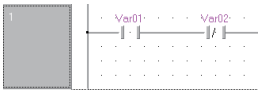
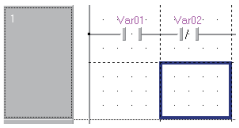
Select a program editing mode. The following table shows the selectable modes.

Mode		Description	Reference
Select mode		Place ladder symbols such as contacts and coils in a ladder block. Connect ladder symbols with a line. This mode is used for editing programs mainly with the mouse.	Section 8.2
	Interconnect mode	Connect placed ladder symbols with a line.	Section 8.3.2
Guided mode		Place ladder symbols such as contacts, coils, and instructions within the grid frames. This mode is used for editing programs mainly with the keyboard.	Section 8.10

■ Mouse cursor and grid

The following table shows different appearances of the mouse cursor and grid according to the mode.

Table 6.4.1-1 Displays in different editing modes for the structured ladder editor

Mode	Menu and toolbar	Auto connect	Mouse cursor	Grid display
Select mode	[Edit] ⇒ [Select Mode]	OFF		
		ON		
Interconnect mode	[Edit] ⇒ [Interconnect Mode]	OFF		
		ON		
Guided mode	[Edit] ⇒ [Guided Mode] ⇒ [Guided Editing]	OFF		

8.2 Editing in Select Mode

Q CPU L CPU FX

This section explains how to enter instructions.

8.2.1 Entering ladder symbols

Enter ladder symbols such as contacts, coils, and application instructions.

Table 8.2.1-1

Ladder symbols	Toolbar	Shortcut key
Open Contact*1		1
Close Contact*1		2
Coil*1		7
Jump		Ctrl + J
Return		Ctrl + R
Open Branch*1		3
Close Branch*1		4
Input Label		9
Output Label		0
Horizontal Line		6
Vertical Line		5
Rising Pulse*1,*2		–
Falling Pulse*1,*2		–
Rising Pulse Close*1,*3		–
Falling Pulse Close*1,*3		–
Comment		Ctrl + M

*1: These items cannot be used for FBD.

*2: Not supported by FX0, FX0S, FX0N, FXU, and FX2C.

*3: Supported by Universal model QCPU/LCPU.

Operating procedure

1. **Select [Edit] ⇒ [Ladder Symbol] ⇒ [(ladder symbol)].**

   The shape of the mouse cursor changes according to the selected ladder symbol.

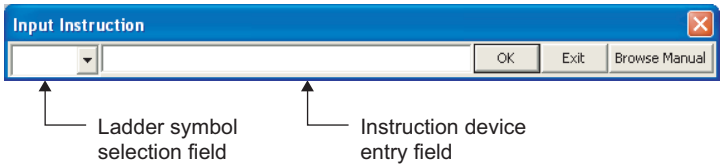
2. **Click the position where the ladder symbol is entered in the program editing area.**
   The selected ladder symbol is entered.

8.2.2 Entering instructions

Enter an instruction in the Select mode.

Operating procedure

1. **Select [Edit] ⇒ [Input Instruction] ( ).**
   The Input Instruction screen is displayed.



The following table shows the display contents of the screen.

Name	Description
Ladder symbol selection field	Select a ladder symbol. Clicking the button displays the list of ladder symbols.
Instruction device entry field	Enter an instruction and/or a device.

2. **Enter an instruction and device, and click the OK button.**
   The shape of the cursor changes according to the selected instruction.

3. **Click the desired position.**
   The instruction is entered at the cursor position.

■ Changing instruction

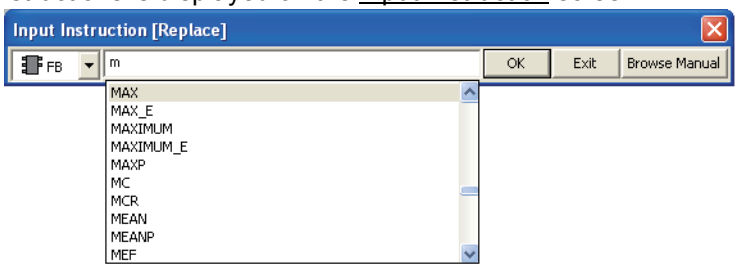
Change entered operator, function, or function block.

Operating procedure

1. **Select an operator, function, or function block to be changed.**

2. **Press the initial letter of the instruction to be changed on the keyboard.**

   A list of instructions is displayed on the Input Instruction screen.

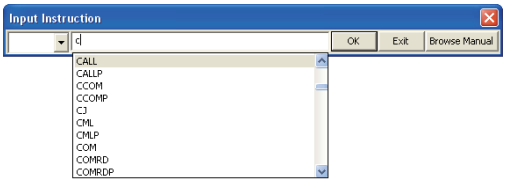


3. **Select an instruction and click the** OK **button.**

   The operator, function, or function block is changed.
   After changing the instruction, adjust the arguments of the instruction if necessary.

Point

- **Entering POUs**
  Operators, functions, and function blocks can also be selected from the Function Block Selection window. (☞ Section 6.2.1)
- **Instruction device entry field**
  - When more than one character of an instruction/label is entered on the Input Instruction screen, options of instruction/label whose first characters match are displayed. An instruction/label can be selected by using the ↑ / ↓ key.



  - When nothing is entered in the ladder symbol selection field, 'instruction + space + device/label' can be entered. (For example: ld X0) However, when an instruction exists as a ladder symbol; such as JMP and RET, is entered, it is entered as a ladder symbol. For entering in functional description, select "FB" on the ladder symbol selection field, and enter an instruction such as JMP.
- **Entering unregistered labels**
  By setting the option, a new label setting can be added on the Label Registration/Selection screen when an unregistered label is entered.
  Check the "Declare new label name" item under [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "Label". (☞ Section 14.2)
- **Browse Manual button**
  A detail of the instruction can be displayed by clicking the Browse Manual button on the Input Instruction screen. (☞ GX Works2 Version 1 Operating Manual (Common))

8.3 Drawing Lines

Q CPU L CPU FX

This section explains how to create lines in a program.

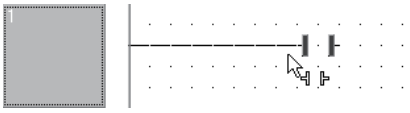
8.3.1 Connecting lines automatically when entering ladder symbols

When entering ladder symbols of contacts/coils/jump/return in the Select mode, the line can be connected automatically.

Operating procedure

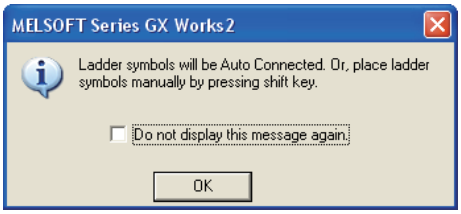
1. **Select [Edit] ⇒ [Ladder Symbol] ⇒ [(ladder symbol to be entered)].**

   A graphical image of the selected ladder symbol is appended to the mouse cursor.
   If a line can be connected to the left-hand horizontal direction, a line is displayed to the left-hand direction.



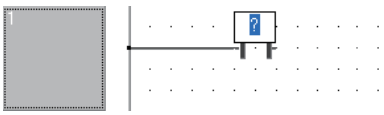
2. **Click the position where the ladder symbol is entered.**

   If a lines can be connected to the left-hand horizontal direction, the following message is displayed.


MELSOFT Series GX Works2
Ladder symbols will be Auto Connected. Or, place ladder symbols manually by pressing shift key.
Do not display this message again.
OK

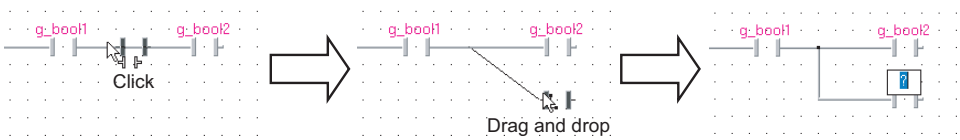
3. **Click the** OK **button.**

   The selected ladder symbol is entered and the line is connected automatically to the left-hand horizontal direction.



Point

● **Entering position of ladder symbols**
When entering the ladder symbols, click and drag a ladder symbol moves the entering position of the ladder symbols.
This function is useful when creating a ladder in parallel as shown below.



8.3.2 Connecting ladder symbols with lines

Connect ladder symbols with a line.

Operating procedure

1. **Select [Edit] ⇒ [Select Mode] ( )/[Interconnect Mode] ( ).**

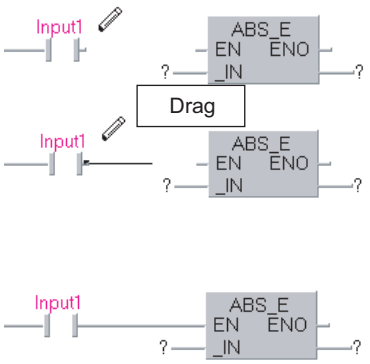
   For the interconnect mode, the cursor changes to .

2. **For the select mode, click the start position of the line.**

   The cursor changes to .

3. **Drag the line from the start position to the end position.**

   A line is drawn in a vertical or horizontal straight line.



8.3.3 Connecting lines automatically

Connect lines automatically by specifying the start and end points.

Operating procedure

1. **Select [Edit] ⇒ [Auto Connect].**

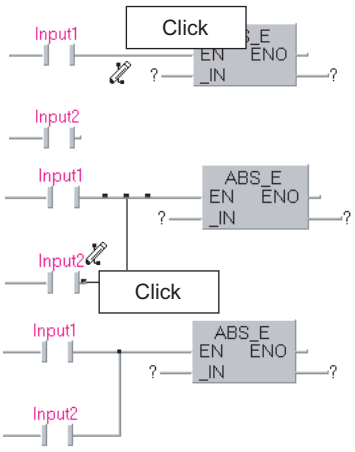
   For the interconnect mode, the cursor changes from to .

2. **Click the start position.**

   For the interconnect mode, the cursor changes to .

3. **Click the end position.**

   The line is automatically routed.



8.3.4 Overwriting input/output variable with lines

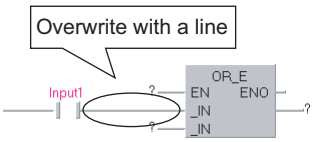
Overwrite an input/output variable of a function or function block with a line.

Operating procedure

1. **Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "FB/FUN".**

2. **Select "Pin overwrites".**

3. **Select [Edit] ⇒ [Auto Connect].**



4. **Draw a line over the input or output variable.**
   The existing input/output variable is automatically overwritten with the line.

8.3.5 Rearranging lines automatically

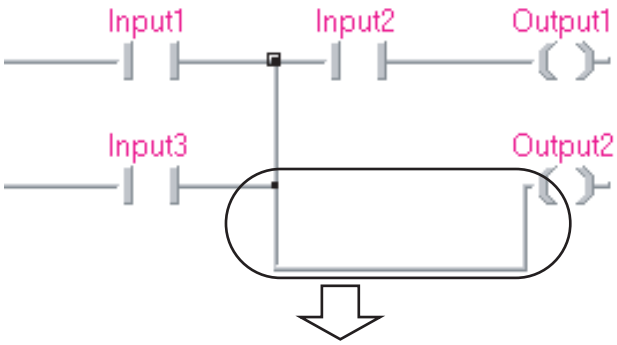
Rearrange and redraw a line when the Auto connect function is activated.

Operating procedure

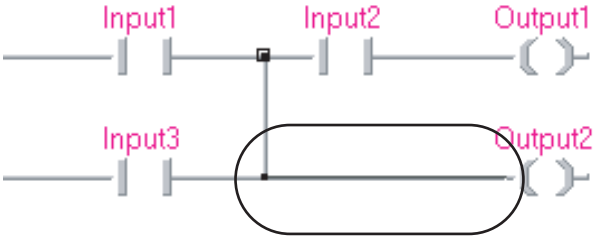
1. **Select the line to be rearranged.**

2. **Select [Edit] ⇒ [Recalculate Line].**

<Before automatic arrangement execution>



<After automatic arrangement execution>



8.3.6 Inserting and deleting rows and columns

Insert and delete rows and columns.

■ Inserting rows and columns

Insert a row or a column.

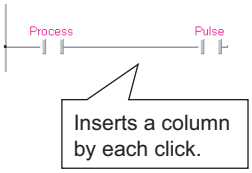
Operating procedure

1. **Select [Edit] ⇒ [Insert Row] ( )/[Insert Column] ( ).**

   The cursor changes to ↕ or ↔.

2. **Click the position where a row or column is inserted.**

   A row or column is inserted by each click.



■ Deleting rows and columns

Delete a row or a column.

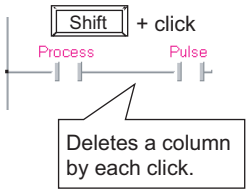
Operating procedure

1. **Select [Edit] ⇒ [Insert Row] ( )/[Insert Column] ( ).**

   The cursor changes to ↕ or ↔.

2. **Hold down the Shift key and click the position where a row or column is deleted.**

   A row or column is deleted by each click.



8.4 Operating Ladder Symbols

Q CPU L CPU FX

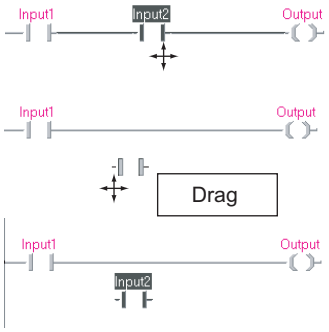
This section explains how to operate ladder symbols such as contacts or coils in the select mode.

8.4.1 Moving ladder symbols

Disable the Auto connect function and move a ladder symbol.

Operating procedure

1. **Select [Edit] ⇒ [Select Mode] ( ).**
   The cursor changes to .
2. **Click a ladder symbol.**
3. **Drag it to the desired position.**

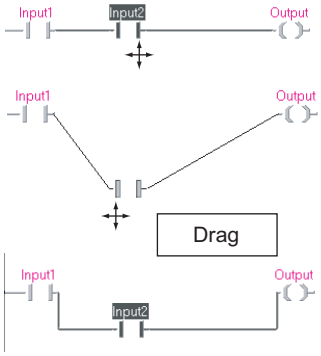


8.4.2 Moving ladder symbols with lines connected

Enable the Auto connect function and move a ladder symbol with the lines connected.

Operating procedure

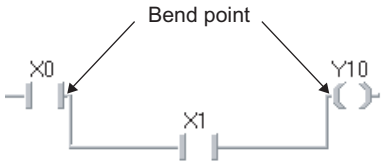
1. **Select [Edit] ⇒ [Auto Connect].**
   The cursor changes from to .
2. **Click a ladder symbol.**
3. **Drag it to the desired position.**
   The ladder symbol moves with the lines connected.



Point

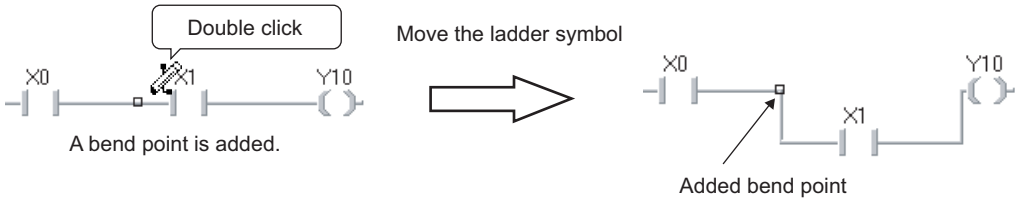
● **Bend points of the line**

The bend points of the line when the ladder symbol is moved, are at the adjacent points of ladder symbols.

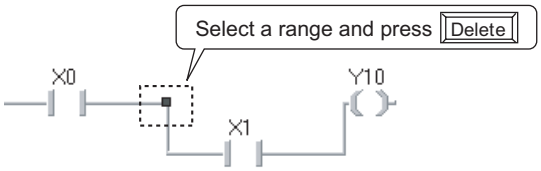


A bend point can be changed to any desired point by adding a bend point on the line as shown below.
When adding a bend point, select [Edit] ⇒ [Interconnect Mode] ( ).

[Interconnect Mode] ( ) [Select Mode] ( )



Note that when deleting the added bend point, delete not only the line but the bend point as well as shown below.



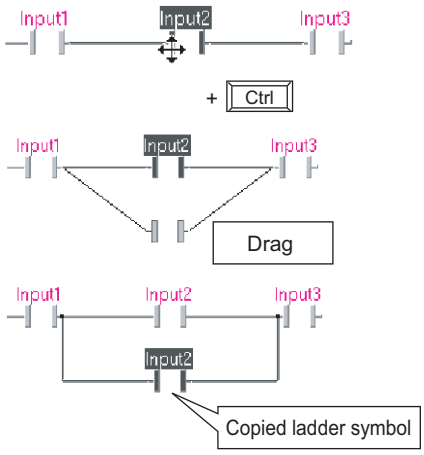
8.4.3 Copying ladder symbols

Copy a ladder symbol within the editor or to another structured ladder/FBD editor.

● Copying ladder symbols by the drag-and-drop operation
Ladder symbols can be copied within the editor.

Operation

1. Hold down the Ctrl key and click the ladder symbol.
2. Drag it to the desired position.



● Copying ladder symbols using the clipboard

Ladder symbols can be copied within the same editor or to another structured ladder/FBD editor by the basic menu options using a clipboard or shortcut keys.

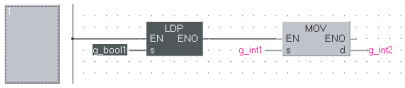
Operation

1. Select [Edit] ⇒ [Cut] ( )/[Copy] ( ).
2. Select [Edit] ⇒ [Paste] ( ).
3. Click the desired position. The upper left of the pasted position is the position to be clicked.

Point

- **Copying ladder symbols to other ladder blocks**
  Ladder symbols cannot be copied or moved to other ladder blocks by the drag-and-drop operation when the Auto connect function is enabled.
  In order to copy or move ladder symbols, disable the Auto connect function or use the clipboard.
  Select [Edit] ⇒ [Auto Connect] to switch the Auto connect function ON/OFF.
- **Copying ladder symbols by the drag-and-drop operation when the Auto connect function is enabled**
  The line of the copied ladder symbol is connected automatically when the Auto connect function is activated. If the line is not connected properly, or ladder symbols are overlapped, disable the Auto connect function by selecting [Edit] ⇒ [Auto Connect] (uncheck the item) and correct the line.
- **Cutting/copying ladder symbols using a clipboard**
  When cutting or copying ladder symbols using a clipboard, the selection range differs between left-clicking and right clicking of a mouse.
  Select the menu by left-clicking on the ladder symbol to delete lines and a ladder symbol. Select the menu by right clicking on the ladder symbol to leave the lines and delete the ladder symbol only.

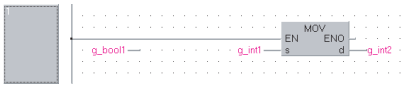
< For cutting function >



Left-click on the ladder symbol and select [Edit]⇒[Cut]

A ladder symbol and lines are cut.

Right-click on the ladder symbol and select [Edit]⇒[Cut]



Only a ladder symbol is cut.

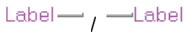
8.5 Changing Type of Contact and Coil

Q CPU L CPU FX

This section explains how to change the type of contact and coil.

8.5.1 Setting the type of contact and coil

The following table shows the types that can be set for contacts and coils.

Type		Ladder symbol
Contact*1	Open Contact	
	Close Contact	
	Rising Pulse*2	
	Falling Pulse*2	
	Rising Pulse Close*3	
	Falling Pulse Close*3	
Coil*1	Normal	
	Negation	
	Set	
	Reset	
Bit type input/output pin	Open Contact	
	Close Contact	
Jump	Open Contact	
	Close Contact	
Return	Open Contact	
	Close Contact	

*1: These items cannot be used for FBD.

*2: Not supported by FX0, FX0S, FX0N, FXU, and FX2C.

*3: Supported by Universal model QCPU/LCPU.

Operating procedure

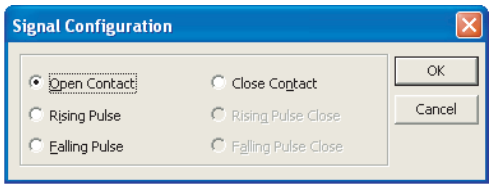
1. **Select a contact or coil whose type is changed.**

2. **Select [Edit] ⇒ [Signal Configuration] ⇒ [Configure].**

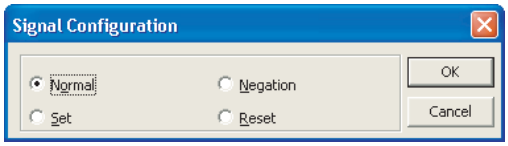
3. **Select the type on the Signal Configuration screen.**

4. **Click the [OK] button.**
   The selected contact or coil is set.

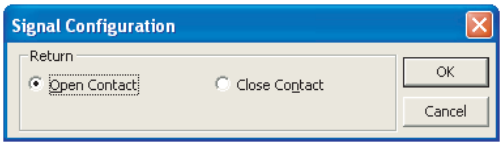
<Contact selected>



<Coil selected>

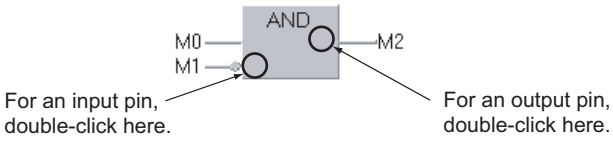


<Bit type input/output pin, jump or return selected>



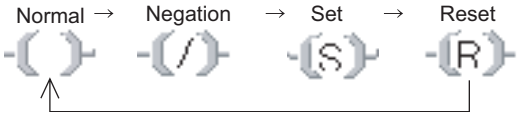
Point

- **Setting the type of contact and coil**
  The type of contact or coil can be set by double-clicking a contact or coil.
- **Bit type input/output pin**
  For a bit type input pin and a bit type output pin connected to a POU such as an FB or function, its contact type of open/close can be changed.
  To change the type of a contact, double-click on the position designated in the following figure, or click on the position designated in the following figure and select [Edit] ⇒ [Signal Configuration] ⇒ [Configure].



8.5.2 Changing contact and coil in predetermined order

The following table shows the order when changing the type of contact and coil.

Type	Change sequence
Contact*1	Open Contact → Close Contact → Rising Pulse*2 → Falling Pulse*2 → Rising Pulse Close*3 → Falling Pulse Close*3
Coil*1	Normal → Negation → Set → Reset 
Bit type input/ output pin	Open Contact → Close Contact Label ← Label
Jump	Open Contact → Close Contact Label ← Label
Return	Open Contact → Close Contact Return ← Return

*1: These items cannot be used for FBD.

*2: Not supported by FX0, FX0S, FX0N, FXU, and FX2C.

*3: Supported by Universal model QCPU/LCPU.

Operating procedure

1. **Select a contact or coil.**

2. **Select [Edit] ⇒ [Signal Configuration] ⇒ [Toggle].**

8.6 Operating Functions and Function Blocks

Q CPU L CPU FX

This section explains how to operate functions and function blocks.

8.6.1 Adding variables automatically when entering functions and function blocks

Configure the option setting in order to add input/output variables automatically when functions or function blocks are entered. (This setting is enabled only when the Auto connect function is activated.)

Operating procedure

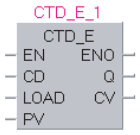
1. **Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "FB/FUN".**

2. **Select "Automatic input/output labels".**

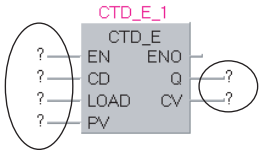
   To add an output variable to ENO, select "Automatic ENO labels".

3. **Select [Edit] ⇒ [Auto Connect].**

<Without adding input/output variables>



<Adding input/output variables>



8.6.2 Editing variable names and instance names

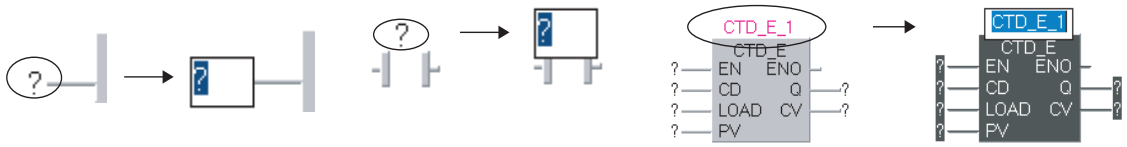
Edit a variable name or function block instance name.

Operating procedure

1. **Click the entry field of a ladder symbol such as a contact, coil, or input/output label.**
   The entry field is enabled for editing.

2. **Edit the variable name or instance name.**

<Input variable> <Contact> <Function block>



Point

- **Using set label names**
  Right-click the entry field when it is enabled for editing, and select the label name on the Label Registration/ Selection screen.
  (☞ Section 6.2.2)

8.6.3 Changing the number of arguments for functions and function blocks

Change the number of arguments of functions and function blocks in the application functions.
For details of functions whose number of arguments can be changed, refer to the following manual.

☞ MELSEC-Q/L Structured Programming Manual (Application Functions)

☞ FXCPU Structured Programming Manual (Application Functions)

To add or delete an argument, select a function or a function block and proceed the following operation.

● Adding an argument

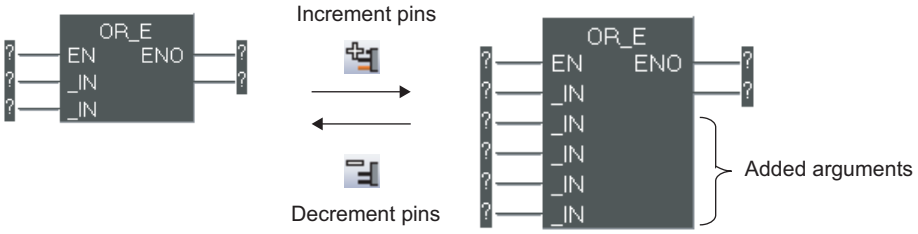
Operation

• Select [Edit] ⇒ [Number of Pins] ⇒ [Increment] ( ).

● Deleting an argument

Operation

• Select [Edit] ⇒ [Number of Pins] ⇒ [Delete] ( ).



Point

● **Adding and deleting arguments**
Arguments can also be added or deleted using the following method.

• Using the [+] or [−] key
• Changing the height of the ladder symbol using the mouse

8.7 Changing Display Format of Variables

Q CPU L CPU FX

This section explains how to change the display format of variables.

8.7.1 Displaying variable names in multiple lines

Change the view mode to display variable names of contacts and coils in multiple lines by setting the option.

Operating procedure

1. **Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "Label".**
2. **Select "Display label name/comment of contact or coil in multiline".**
3. **Set the values of "Display Lines" and "Visible Characters per Line".**

<Single line>

<Multiple lines>

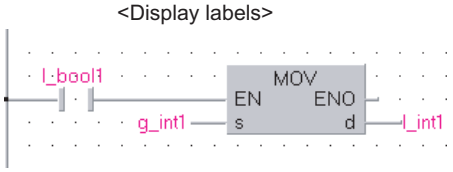
8.7.2 Displaying labels and devices simultaneously

Change the view mode to display the labels and devices simultaneously by setting the option.

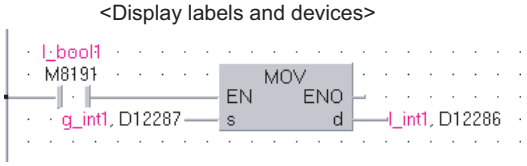
Operating procedure

1. **Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "Label".**
2. **Select "Display labels and devices".**
   The assigned devices are displayed.

<Display labels>



<Display labels and devices>



Point

- **Devices not to be displayed**
  The devices are not displayed in the following cases even the option is set.
  - When the program is never compiled
  - When the labels are used for array element
  - When structured data type labels are used
- **Edit and find/replace when the labels and devices are displayed simultaneously**
  When the labels and devices are displayed simultaneously, only labels can be the target of edit and find/replace.

8.7.3 Displaying instance names in multiple lines

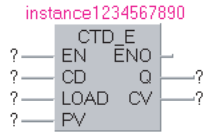
Display wrapped function block instance name within the width of function block by setting the option.

Operating procedure

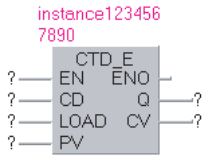
1. **Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "FB/FUN".**

2. **Select "Wrap instance name for function block".**

<Single line>



<Wrapping a line>



8.7.4 Specifying the number of displaying characters for variable names

Change the number of displaying characters for variable names of functions and function blocks by setting the option.

Operating procedure

1. **Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "FB/FUN".**

2. **Select "Specify the number of enable characters for label name/comment".**

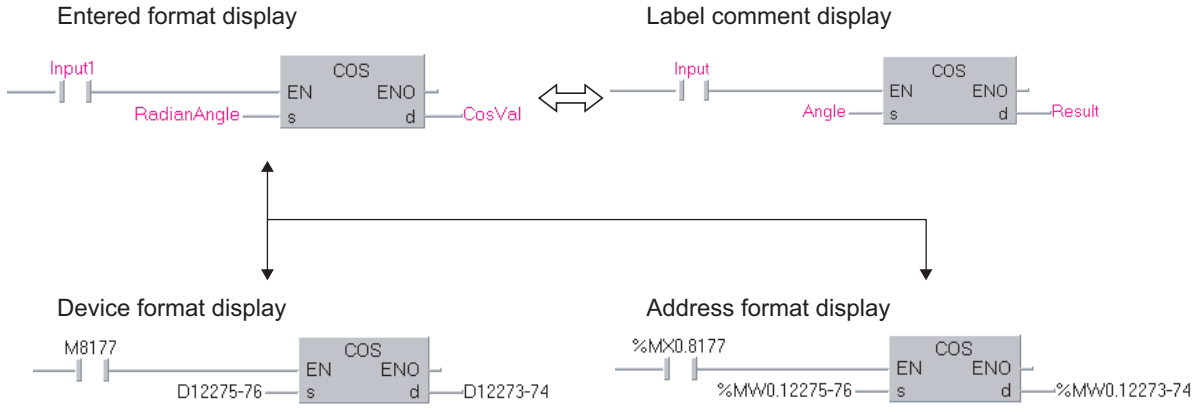
3. **Set the number of characters (2 to 255).**

<16 characters>

<8 characters>

8.7.5 Changing display format of variable

Change the display format of variable to the device/address/comment format.



● Displaying in the entered format

Operation

- Select [View] ⇒ [View Mode] ⇒ [Label].
  Variables are displayed in the format as they are entered.

● Displaying in the device format

Operation

- Select [View] ⇒ [View Mode] ⇒ [Device].
  Entered format is displayed in the device format.
  As for labels, the assigned devices are displayed in the device format.

● Displaying in the address format

Operation

- Select [View] ⇒ [View Mode] ⇒ [Address].
  Devices are displayed in the address format.
  As for labels, the assigned devices are displayed in the address format.

● Displaying label comments

Operation

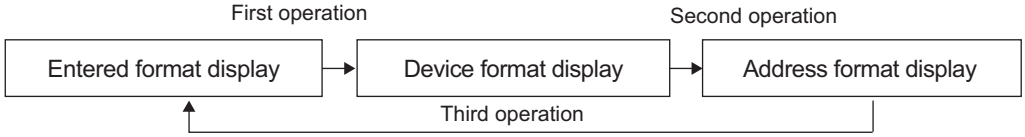
- Select [View] ⇒ [View Mode] ⇒ [Comment].
  Label comments are displayed.
  Device comments are not displayed.

● Switching label/device/address display

Operation

- Select [View] ⇒ [View Mode] ⇒ [Change Label-Device-Address Mode].
  The display is switched in order (label, device, address) by selecting the menu each time.

[Change Label-Device-Address Mode]

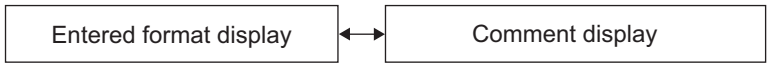


● Switching label/comment display

Operation

• Select [View] ⇒ [View Mode] ⇒ [Change Label-Comment Mode].
The display is switched between label and comment by selecting the menu each time.

[Change Label-Comment Mode]



● Batch-changing display of all program editors to device format display

Operation

• Select [View] ⇒ [All Device Display].
The display of all program editors (except for ST) being opened is changed to the device format display.

● Batch-canceling device format display on all program editors

Operation

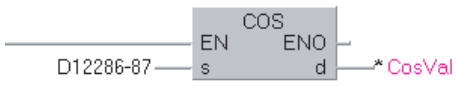
• Select [View] ⇒ [Cancel All Device Display].
The device format display of all program editors is canceled, and the display returns to the entered format.

Point

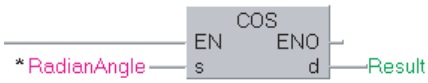
● **Displaying uncompiled labels and label comments**

An asterisk (*) is prefixed to each label name of uncompiled labels to which devices are not assigned when the display format is changed to the device format or address format.
An asterisk (*) is prefixed to each label name of labels to which label comments are not set when the display format is changed to the comment display.

<Device format display>



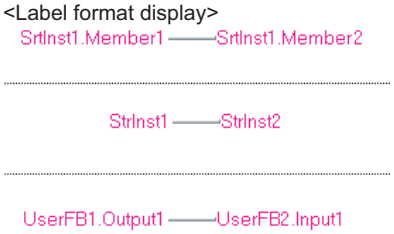
<Comment display>



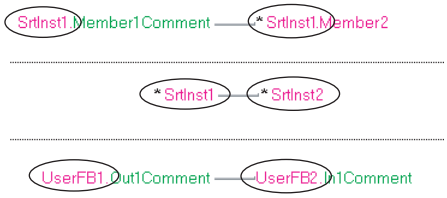
● **Structured data type/function block labels**

Structured data type/function block labels are displayed as label names even when the display format is changed to the comment display.

<Label format display>



<Comment display>



● **Constant type labels**

When the display format is the device format, constant type labels are displayed as constants set in a label setting editor.

<Label format display>

<Device format display>

● **Restrictions on operations when changing the display format**

Program editing and search/replace functions are disabled in the device/address format or comment display. To operate these functions, return the setting to [Standard].

8.8 Editing Ladder Blocks

Q CPU L CPU FX

This section explains how to edit ladder blocks.

8.8.1 Inserting ladder blocks

Add or insert a new ladder block.

● Inserting a ladder block at the start

Operation

• Select [Edit] ⇒ [New Ladder Block List] ⇒ [Top].
A new ladder block is inserted at the start of all ladder blocks.

● Inserting a ladder block in front of the current ladder block

Operation

• Select [Edit] ⇒ [New Ladder Block List] ⇒ [Before] ( ).
A new ladder block is inserted in front of the ladder block being edited.

● Inserting a ladder block in back of the current ladder block

Operation

• Select [Edit] ⇒ [New Ladder Block List] ⇒ [After] ( ).
A new ladder block is inserted in back of the ladder block being edited.

● Inserting a ladder block at the end

Operation

• Select [Edit] ⇒ [New Ladder Block List] ⇒ [Bottom].
A new ladder block is inserted at the end of all ladder blocks.

8.8.2 Deleting ladder blocks

Delete a selected ladder block.

Operating procedure

• Select [Edit] ⇒ [Delete].

8.8.3 Cutting, copying, pasting, and moving ladder blocks

Cut/copy/paste/move ladder blocks within the editor or to another program editor on the screen.
Ladder blocks can be pasted/moved between program editors with the same programming language.

Operating procedure

1. **Select a ladder block by clicking the ladder block header.**

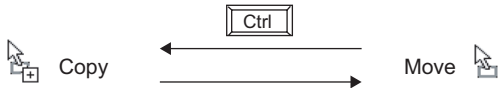
2. **Select [Edit] ⇒ [Cut] ( )/[Copy] ( ).**

3. **Select a ladder block to which cut/copied ladder block is pasted, and select [Edit] ⇒ [Paste] ( ).**
   A cut/copied ladder block is inserted above the selected ladder block.

■ Copying/moving ladder blocks by the drag-and-drop operation

Ladder blocks can be copied/moved by clicking the ladder block header and the drag-and-drop operation.

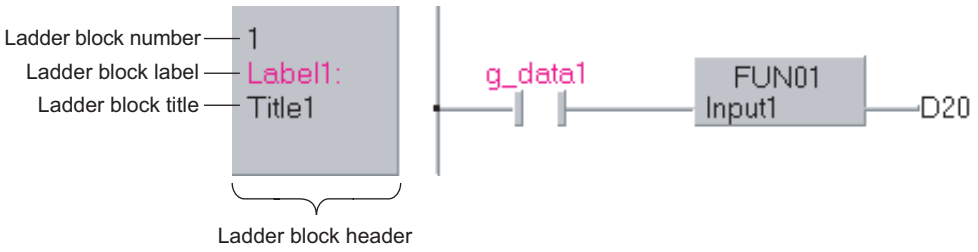
- To cancel the copy/move operation, press the Esc key during the drag-and-drop operation.
- To switch the copy/move operations, press the Ctrl key during the drag-and-drop operation. (Different icons are displayed for the copy and move operations.)



8.8.4 Editing ladder block headers

A ladder block header is an area that displays information set for each ladder block.
Create a ladder block label and ladder block title.

Screen display



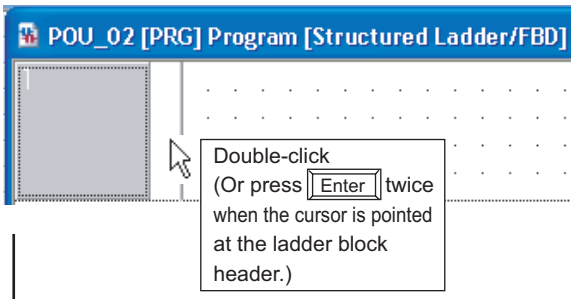
Display contents

Name	Description
Ladder block number	A number automatically assigned from the start.
Ladder block label	Enter a character string to be specified as the jump target when using the jump instruction. A colon (:) needs to be entered at the end of the character string. A maximum number of characters that can be entered is 7.
Ladder block title	Enter a meaning of the program as a title when necessary. A maximum number of characters that can be entered is 20.

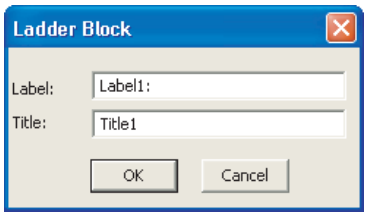
Operating procedure

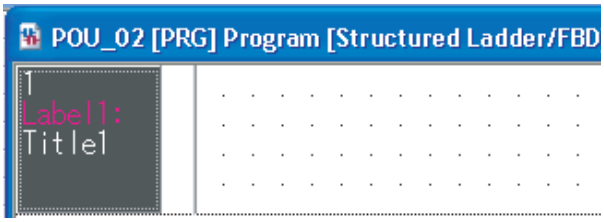
1. **Double-click the ladder block header.**

   The Ladder Block screen is displayed.


POU_02 [PRG] Program [Structured Ladder/FBD]
Double-click
(Or press Enter twice when the cursor is pointed at the ladder block header.)

2. **Enter the ladder block label and ladder block title.**





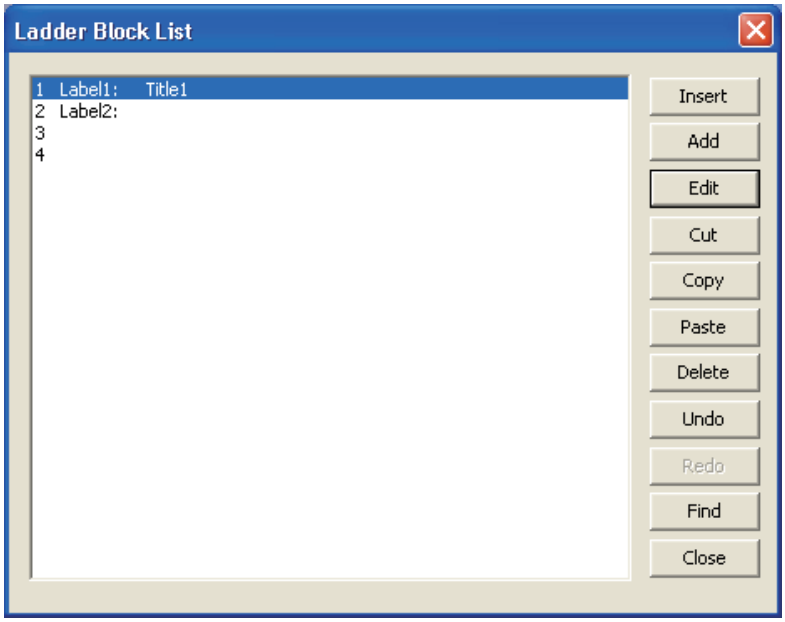
8.8.5 Editing listed ladder blocks

Edit listed ladder blocks in the program. The following information is displayed in the list.

- Ladder block number
- Ladder block label
- Ladder block title

Screen display

Select [Edit] ⇒ [Ladder Block List].



Screen button

- Insert

  Inserts a new ladder block in front of the selected ladder block.

- Add

  Inserts a new ladder block at the end of the existing ladder blocks.

- Edit

  Displays an editing screen of the ladder block header.

- Cut , Copy , Paste , Delete , Undo , Redo

  Same functions as the buttons on program editors.

- Find

  Searches for a ladder block based on the ladder block label.

- Close

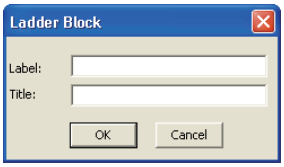
  Closes the Ladder Block List screen.

8.8.6 Setting ladder block labels/titles

Set a ladder block label/title on the Ladder Block screen.

Operating procedure

1. **Select [Edit] ⇒ [Ladder Symbol] ⇒ [Ladder Block Label].**



2. **Set the ladder block label and ladder block title, and click the** OK **button.**

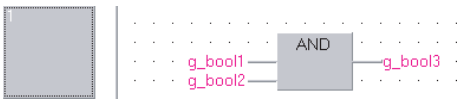
8.8.7 Switching to display/hide left power rail

Switch to display/hide left power rail for each ladder block.
When using FBD, switch the left power rail to hide.

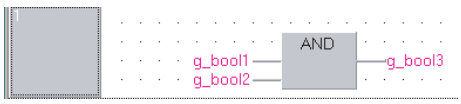
Operating procedure

- Select a ladder block, and select [Edit] ⇒ [Ladder Symbol] ⇒ [Left Power Rail] ( ).
  The left power rail of selected ladder block is switched to display/hide.

<Display left power rail>

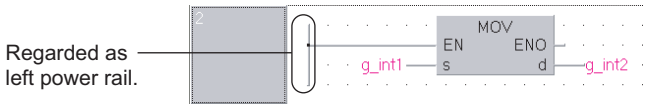


<Hide left power rail>

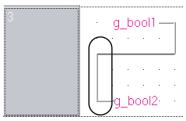


Restrictions

● **Entering position of line when hiding left power rail**
When a vertical line is entered on the position of left power rail, the vertical line is regarded as the left power rail.
When entering a vertical line, avoid the left power rail position.



If a line is entered on the position of left power rail as shown below, a warning message "Multiple ladders in one network. (C2034)" is displayed on the Output window at compilation.



● **Compilation result when FBD is used**
When multiple ladder blocks are created for single ladder block, a warning message "Multiple ladders in one network. (C2034)" is displayed on the Output window at compilation.
Disabling the warnings is recommended when FBD is used.
Set the warning code "C2034" under [Tool] ⇒ [Options] ⇒ "Compile" ⇒ "Output Result" ⇒ "Disable Warning Codes". (☞ Section 10.4.2)

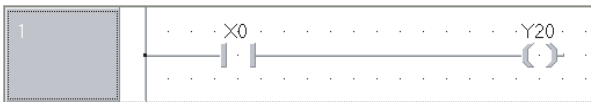
8.8.8 Displaying grid

A grid indicates specific positions, such as tab stop positions and the start/end position of a line, on a program editing area. Switch the grid display on a program editing area.

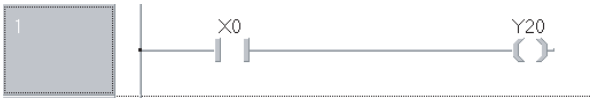
Operating procedure

- Select [View] ⇒ [Grid].

<With grid>



<Without grid>



8.9 Editing Comments

Q CPU L CPU FX

This section explains how to edit comments.
Comments can be entered in the same manner as ladder symbols. (☞ Section 8.2.1)

Operating procedure

- Select [Edit] ⇒ [Ladder Symbol] ⇒ [Comment] ( ).

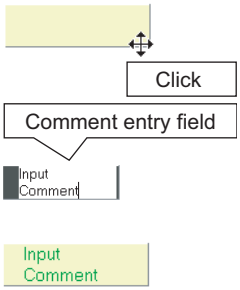
8.9.1 Editing comments

Edit a comment.

Operating procedure

1. **Click the comment.**
   The comment entry field is enabled.

2. **Enter a comment.**
   Press the Ctrl + Enter keys to insert a line feed.



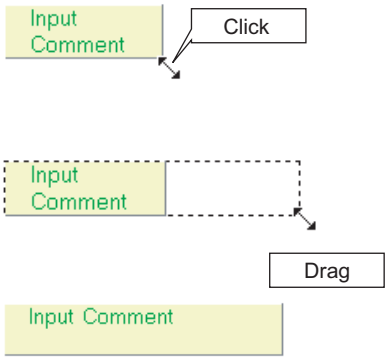
8.9.2 Changing the size of comment entry field

Change the size of a comment entry field.
After changing to the Select Mode, change the size by the following procedure. (☞ Section 8.1.1)

Operating procedure

1. **Click the bottom right corner of the comment.**

2. **Drag the corner to adjust the size.**

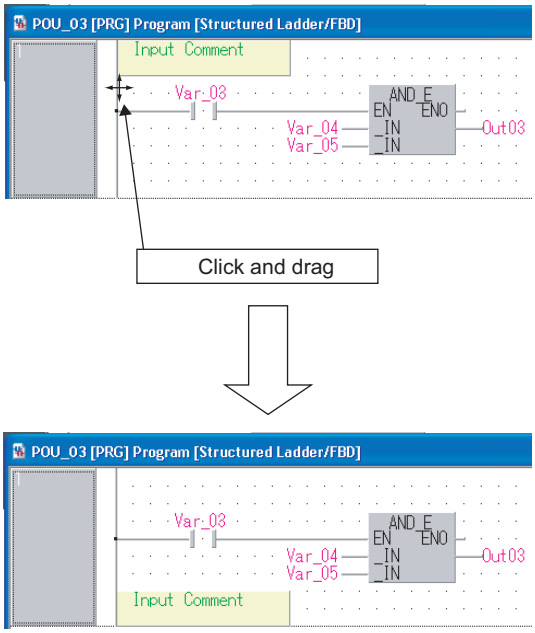


8.9.3 Moving comments

Move a comment.
Comments can be moved only within the same ladder block.

Operating procedure

1. **Click the head (left end) of the comment.**
2. **Drag it to the desired position.**



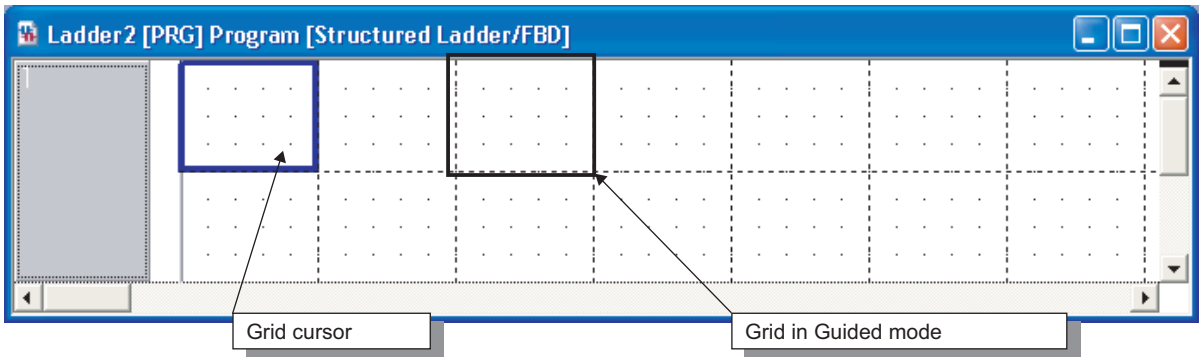
8.10 Editing in Guided Mode

Q CPU L CPU FX

This section explains how to edit programs in the Guided mode, which is convenient when data is entered mainly from the keyboard.

Screen display

Select [Edit] ⇒ [Guided Mode] ⇒ [Guided Editing] ( ).



8.10.1 Overwrite mode and insert mode

Select either overwrite mode or insert mode in the Guided mode.

Edit	Description	Grid cursor color
Overwrite Mode	Overwrites the existing ladder symbol at the cursor position with the entered ladder symbol.	Blue
Insert Mode	Moves the existing ladder symbol at the cursor position to the right and inserts a ladder symbol.	Purple

For switching between overwrite and insert modes, follow the operation below.

Operating procedure

- Select [Edit] ⇒ [Guided Mode] ⇒ [Overwrite Mode]/[Insert Mode].
  The mode changes between overwrite and insert, and the grid cursor color changes.

Point

● **Switching "Overwrite Mode" and "Insert Mode"**
The mode can also be switched by pressing the Insert key.

8.10.2 Entering ladder symbols

The ladder symbol entry method in the Guided mode is the same as that of the Select mode.
For entering ladder symbols, refer to the following section.

☞ Section 8.2.1 Entering ladder symbols

8.10.3 Entering instructions

The following explains how to enter instructions in the Guided mode.
The instruction entry method in the Guided mode is the same as that of the Select mode.
For entering instructions, refer to the following section.

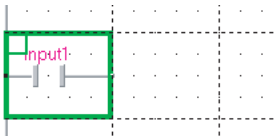
☞ Section 8.2.2 Entering instructions

8.10.4 Connecting ladder symbols with lines

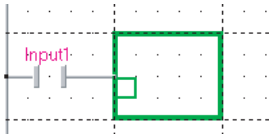
Connect the entered ladder symbols with a line.

Operating procedure

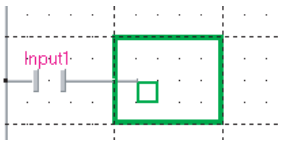
1. **Select [Edit] ⇒ [Guided Mode] ⇒ [Line Mode].**
   The thickness of grid cursor is doubled. The normal grid in the Guided mode is divided into 4×5 parts of smaller grids to specify a position.



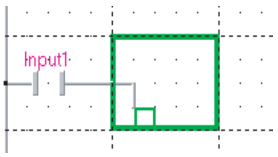
2. **Move the cursor to the position where the line is to be connected by pressing the ↓ / ↑ key.**



3. **Press the 6 button (Horizontal line).**
   A horizontal line is drawn by the length of one divided grid.



4. **Press the 5 button (Vertical line).**
   A vertical line is drawn by the length of one divided grid.



8.10.5 Drawing lines

Draw a line.

Operating procedure

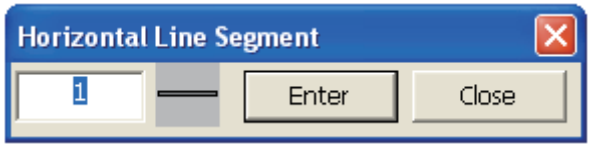
1. **Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "Guided".**

2. **Select "Allow hotkey repeater".**

Draw a line using the Horizontal Line Segment or Vertical Line Segment screen.

Operating procedure

1. **Press the [6] (Horizontal line) or [5] (Vertical line) button.**
   The Horizontal Line Segment or Vertical Line Segment screen is displayed.



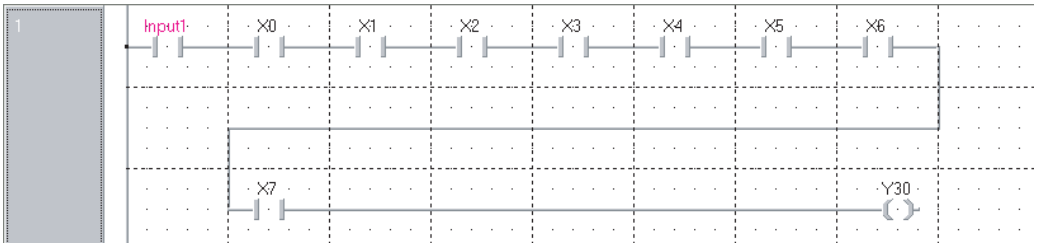
2. **Set the length of the line to be drawn using the grid width/height as the unit of length.**
   A line of the specified length is displayed.

8.10.6 Wrapping ladder

Wrap a ladder if it does not fit in one line.

Operating procedure

1. **Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "Guided".**



2. **Select "Ladder Wrapping".**

Point

- **Target of wrapping ladder to be displayed**
  Ladders edited after setting the above option are wrapped. (The display of edited ladders before setting the above option is not changed.)

8.10.7 Setting Guided mode as the default editing mode

Set the Guided mode as the default editing mode of the structured ladder/FBD editor.

Operating procedure

1. **Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "Guided".**

2. **Select "Open Structure Ladder/FBD Editor in guided mode".**

8.10.8 Entering variable names after contacts and coils

Enter variable names continuously after a contact or a coil is entered.

Operating procedure

1. **Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "Guided".**

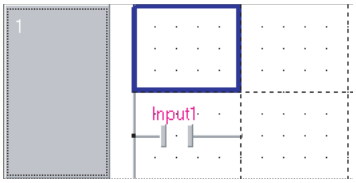
2. **Select "Enter label names after contacts and coils".**

8.10.9 Inserting comment entry fields to ladder blocks to be added

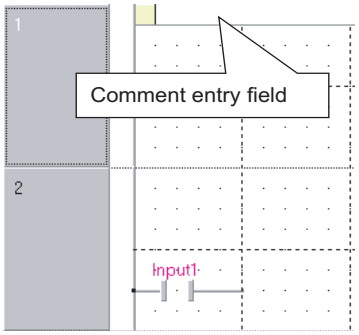
Insert a comment entry field at the top of a ladder block in the Guided mode.

Operating procedure

1. **Select [Edit] ⇒ [Guided Mode] ⇒ [Auto Comment] ( ).**

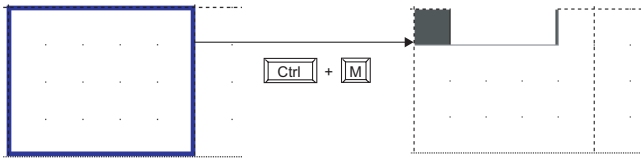


2. **Select [Edit] ⇒ [New Ladder Block List] ⇒ [Before] ( ).**
   A ladder block with a comment entry field is added.



Point

- **Width of automatically inserted comment**
  The width of automatically inserted comment can be changed by the following operation.
  Select [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD" ⇒ "Guided", and set the "Auto Comment Block Width".
- **Entering a comment in the desired grid**
  Hold down the Ctrl key and press the M key, and a comment can be entered to the grid at the cursor position.



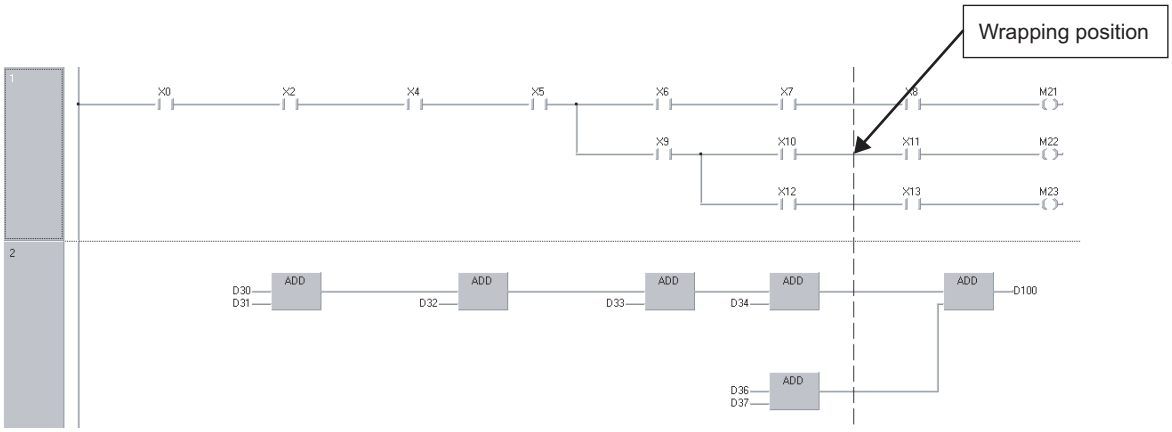
8.11 Checking Wrapping Position for Printing

Q CPU L CPU FX

This section explains how to display the wrapping positions of ladder for printing window.

Operating procedure

- Select [View] ⇒ [Print Wrap Position].
  The wrapping position for printing window is displayed.



Point

● **Wrapping positions**
When the paper size is changed by the print setting, the wrapping positions are adjusted automatically.

MEMO

9 SEARCHING FOR SPECIFIC POSITION

This chapter explains how to move to a specified position in the program.

9.1 Searching for Specific Position in ST Program 9-2
9.2 Searching for Specific Position in Structured Ladder/FBD Program . . 9-4

9.1 Searching for Specific Position in ST Program

Q CPU L CPU FX

This section explains how to search for a specific position in the ST program.
For searching for devices and instructions, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Common)

9.1.1 Jumping to specified line

A cursor jumps to the specified line.

Screen display

Select [Find/Replace] ⇒ [Jump].

Operating procedure

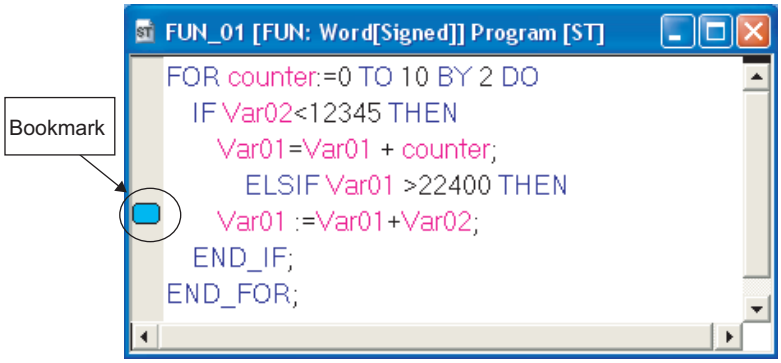
1. Set the items on the screen.

Item	Description
Line No.	Enter a line number to which a cursor jumps. Click ▼ to select a line number from the list of previously searched lines.

2. Click the OK button.
The cursor jumps to the specified line.

9.1.2 Using bookmarks

Use bookmarks that are placed at positions in a program for frequent reference.
Bookmarks allow quick reference to specific positions in a program.



● Setting/canceling a bookmark

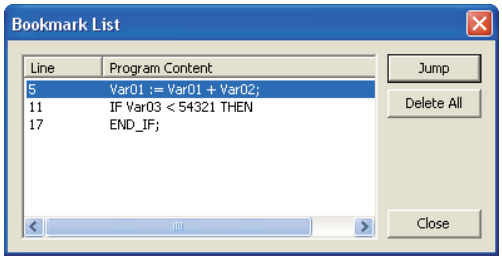
Operation

• Select [Find/Replace] ⇒ [Bookmark] ⇒ [Toggle Bookmark] ( ).
A new bookmark is set at, or the existing bookmark is cleared from, the line where the cursor is placed.

● Jumping from bookmark list

Operation

1. Select [Find/Replace] ⇒ [Bookmark] ⇒ [Bookmark List] ( ).
All registered bookmarks are displayed.



2. Select a bookmark to which a cursor jumps.

3. Click the Jump button, or double-click the selected line.
The cursor moves to the line where the bookmark is set.

Click the Delete All button to cancel all bookmarks.

● Moving to the next bookmark

Operation

• Select [Find/Replace] ⇒ [Bookmark] ⇒ [Next Bookmark] ( ).
The cursor moves to the start of the line where the next bookmark is placed.

● Moving to the previous bookmark

Operation

• Select [Find/Replace] ⇒ [Bookmark] ⇒ [Previous Bookmark] ( ).
The cursor moves to the start of the line where the preceding bookmark is placed.

● Deleting all bookmarks

Operation

• Select [Find/Replace] ⇒ [Bookmark] ⇒ [Delete All Bookmarks] ( ).
All bookmarks are deleted.

9.2 Searching for Specific Position in Structured Ladder/FBD Program

Q CPU L CPU FX

This section explains how to search for a specific position in the structured ladder/FBD program.
For searching for devices and instructions, refer to the following manual.

☞ GX Works2 Version 1 Operating Manual (Common)

9.2.1 Jumping to specified ladder block number

A cursor jumps to the specified ladder block.

Screen display

Select [Find/Replace] ⇒ [Jump].

Operating procedure

1. Set the items on the screen.

Item	Description
Ladder Block No.	Enter a ladder block number to which a cursor jumps. Click ▼ to select a ladder block from the list of previously searched ladder blocks.

2. Click the OK button.
   The cursor jumps to the specified ladder block.

10 CONVERTING/COMPILING PROGRAMS

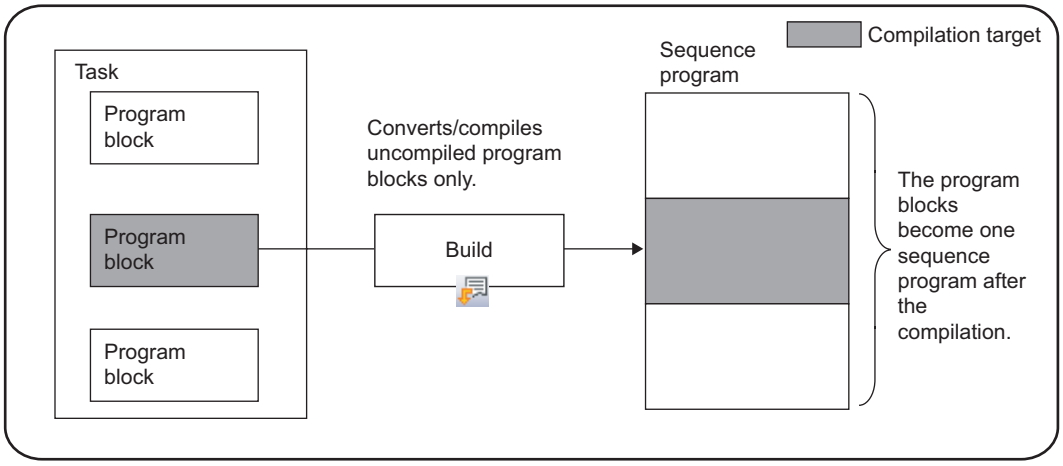
This chapter explains how to convert/compile created programs.
Programs are converted/compiled to sequence programs that can be executed on the programmable controller CPU.

10.1 Converting/Compiling Created Programs 10-2
10.2 Compiling All Programs 10-4
10.3 Executing Online Program Change Simultaneously with Conversion/Compilation 10-6
10.4 Changing Operating Conditions of Compilation 10-6
10.5 Compilation 10-14
10.6 Checking for Errors and Warnings 10-22

10.1 Converting/Compiling Created Programs

Q CPU L CPU FX

This section explains how to compile uncompiled program blocks among all program blocks that are registered to tasks.
Since this process compiles only uncompiled programs, the compiling time can be reduced.

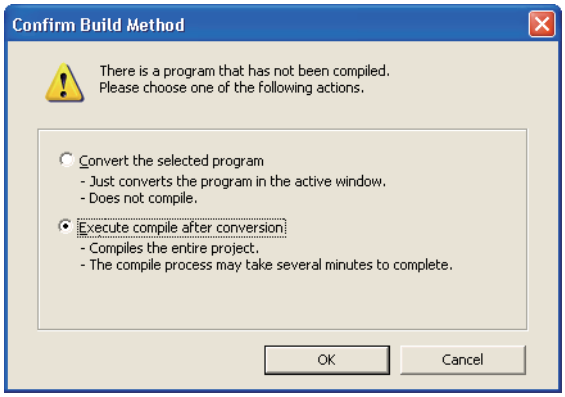


Point

● **Conversion and compilation**
The following explains the difference between conversion and compilation.
Conversion: Confirms edited content of ladder/SFC programs.
Compilation: Assigns devices to labels and creates a code to execute the program in a programmable controller CPU.

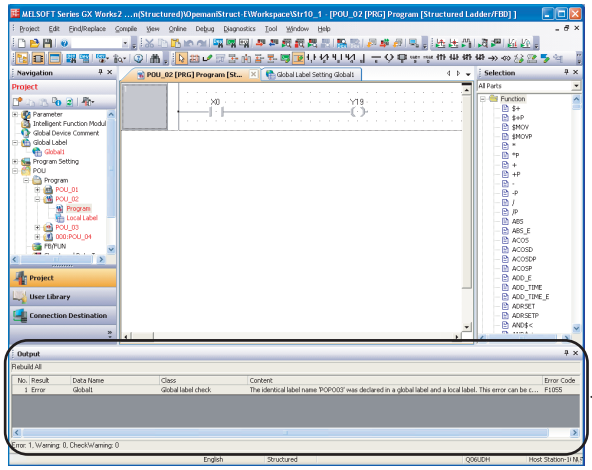
Operating procedure

1. **Select [Compile] ⇒ [Build] ( ).**
The Confirm Build Method screen is displayed.


Confirm Build Method
There is a program that has not been compiled.
Please choose one of the following actions.
Convert the selected program
- Just converts the program in the active window.
- Does not compile.
Execute compile after conversion
- Compiles the entire project.
- The compile process may take several minutes to complete.
OK
Cancel

2. **Select the "Execute compile after conversion" item, and click the OK button.**

Programs are compiled after the conversion and the result is displayed on the Output window.
By double-clicking the result, the corresponding error location in the program is displayed.
For checking errors/warnings, refer to Section 10.6.



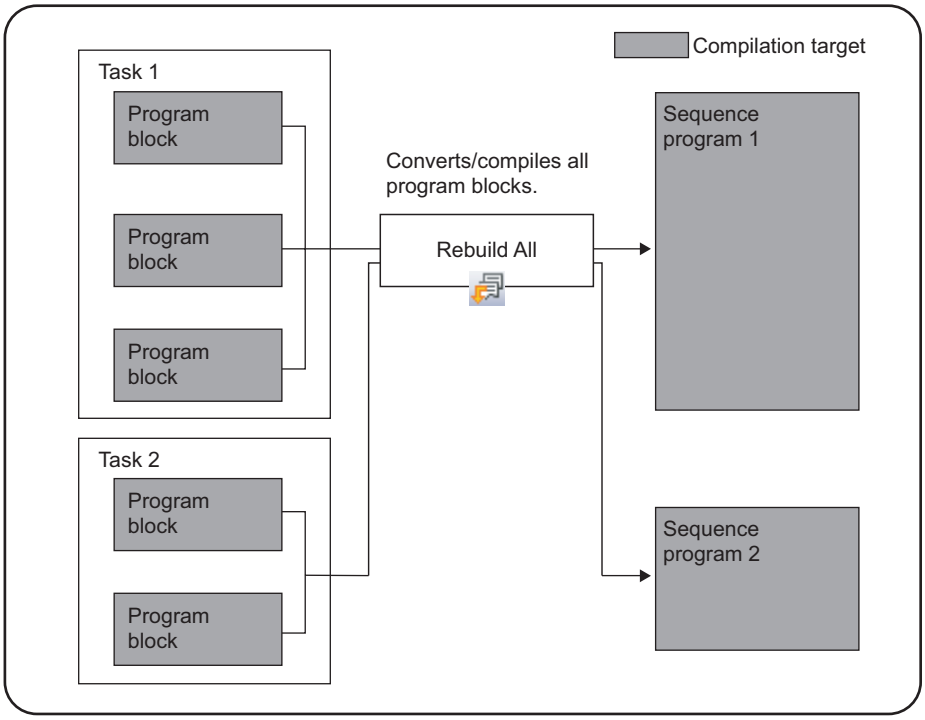
Point

- **Build function**
  Only the program being edited is converted when the "Convert the selected program" is selected on the Confirm Build Method screen.
  When two or more changes are required in a program, and if "Execute compile after conversion" is selected every time program is changed, processing time is required for each compilation.
  To reduce compilation processing time, select "Convert the selected program" first, and select "Execute compile after conversion" after all changes are made in a program.
- **Compiling programs when adding/changing labels**
  For precautions on compiling programs when adding/changing labels, refer to Section 10.5.3.

10.2 Compiling All Programs

Q CPU L CPU FX

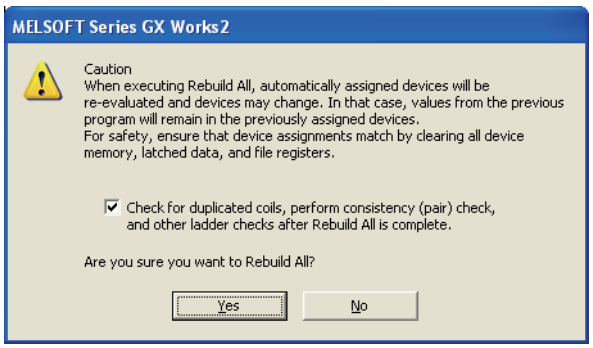
This section explains how to batch compile all program blocks that are registered to tasks.



Operating procedure

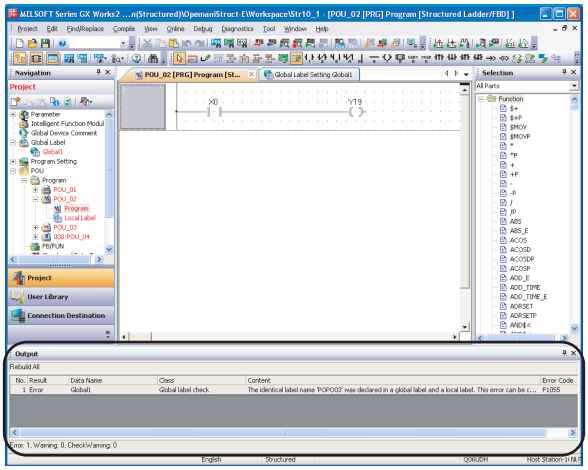
1. **Select [Compile] ⇒ [Rebuild All] ( ).**

   The following message is displayed.
   Uncheck the item if the duplicated coil check, ladder check, and consistency (paring) check are not performed after the compilation.


MELSOFT Series GX Works2
Caution
When executing Rebuild All, automatically assigned devices will be re-evaluated and devices may change. In that case, values from the previous program will remain in the previously assigned devices.
For safety, ensure that device assignments match by clearing all device memory, latched data, and file registers.
Check for duplicated coils, perform consistency (pair) check, and other ladder checks after Rebuild All is complete.
Are you sure you want to Rebuild All?
Yes
No

2. **Execute the compilation after reading and understanding the precaution described on the message.**

All programs are converted/compiled and the result is displayed on the Output window.
By double-clicking the result, the corresponding error location in the program is displayed.
For checking errors/warnings, refer to Section 10.6.



Point

● **Assigning devices to labels when compiling all programs**
For assigning devices to labels when compiling all programs, refer to Section 10.5.

10.3 Executing Online Program Change Simultaneously with Conversion/Compilation

Q CPU L CPU FX

For the operation for executing the Online program change simultaneously with the conversion/compilation, refer to the following manual.

☞ GX Works2 Version 1 Operating Manual (Common)

10.4 Changing Operating Conditions of Compilation

Q CPU L CPU FX

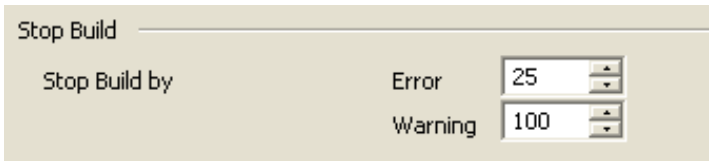
This section explains how to change the operating conditions of compilation.

10.4.1 Changing the number of errors and warnings that stop compilation

Change the number of errors and warnings that stop compilation.
If the number of errors and warnings that occurred during compilation reaches the specified value, the compilation is aborted.

Screen display

Select [Tool] ⇒ [Options] ⇒ "Compile" ⇒ "Output Result".



Display contents

- Set the items on the screen.

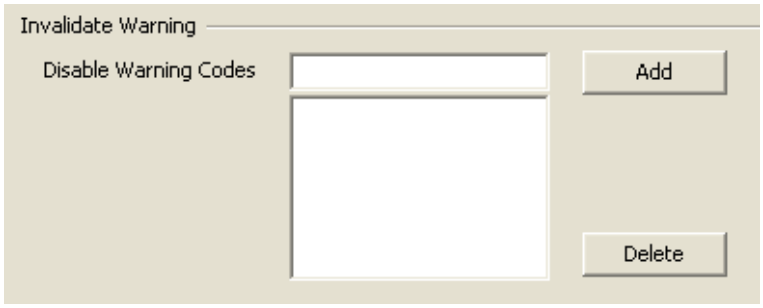
Item	Description
Error	Set the number of errors that stops compilation (1 to 9999).
Warning	Set the number of warnings that stops compilation (1 to 9999).

10.4.2 Hiding warning messages

Hide messages displayed on the Output window when compiling programs.
The registered warnings are not displayed on the Output window.

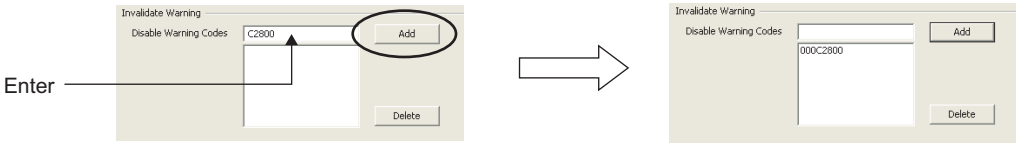
Screen display

Select [Tool] ⇒ [Options] ⇒ "Compile" ⇒ "Output Result".

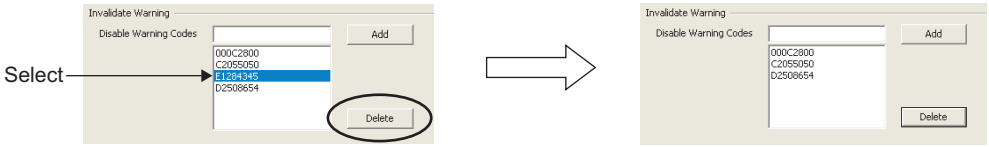


Operating procedure

- To register the warnings, enter the warning code and click the Add button.
  The registered warnings are not displayed on the Output window.



- To cancel the registration, select the warning code and click the Delete button.
  The unregistered warnings are displayed on the Output window.



Point

- **Warning codes**
  Warning codes and their content can be checked in the Output window when compiling programs.
  (☞ Section 10.6)
- **Maximum number of warnings to be invalidated**
  A maximum number of warnings to be invalidated is 100.

10.4.3 Using same name for global label and local label

Use the same name for a global label and a local label.

Operating procedure

1. **Select [Tool] ⇒ [Options] ⇒ "Compile" ⇒ "Basic Setting".**

2. **Check the "Use the same label name in global label and local label" check box.**
   - If this check box is not checked, an error occurs when compiling programs.
   - If this check box is checked, a warning is displayed when compiling programs (Same label names can be used).

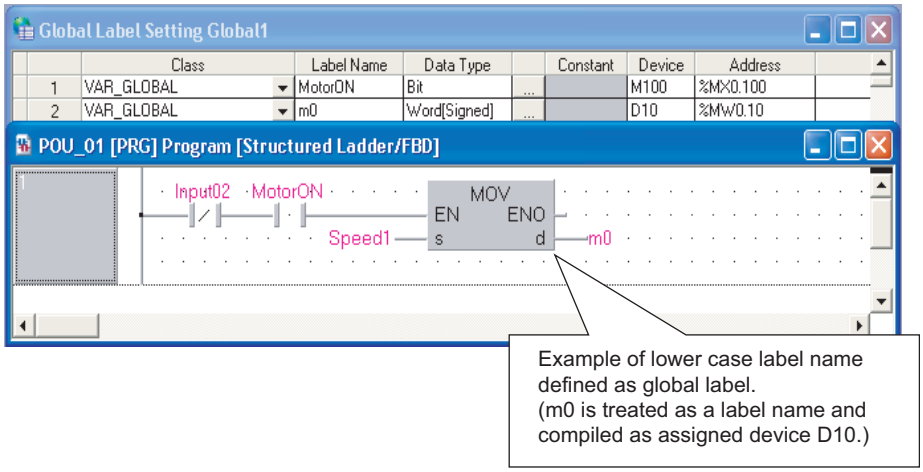
10.4.4 Using same lower case label name as device

Use a label name (for example: m0, x1F) that contains a lower case of alphabetic part of the device.

Operating procedure

1. **Select [Tool] ⇒ [Options] ⇒ "Compile" ⇒ "Structured Ladder/FBD/ST" ⇒ "Compile Condition1".**

2. **Check the "Use lower-case device names as labels" check box.**
   - If this check box is not checked, an error occurs when compiling programs.
   - If this check box is checked, a warning is displayed when compiling programs. (Label names that contain a same lower case as the device can be used.)



Point

- **Label names which cannot be used**
  When a device name is written in upper case, and device number contains lower case in alphabetic part, device whose device number is hexadecimal (such as W device) may cause a compilation error, even "Options" is enabled.
  For example, "W0a1", "W1a" are regarded as devices, therefore, a compilation error is caused. "Wa1" can be used as a label when no numbers exist between device name and device number, even a device name is written in upper case, and device number contains lower case in alphabetic part.
- **Inline structured text**
  For inline structured text, the devices within the range set on the <<Device>> tab of PLC parameter cannot be used as labels. Use the devices out of range set on the <<Device>> tab of PLC parameter.

10.4.5 Connecting PLS, PLF, or ALT outputs directly to other inputs with lines

Connect outputs of the selected function(s) (PLS, PLF, or ALT*1) directly to other inputs with lines.

*1: Supported by FXCPU only.

Operating procedure

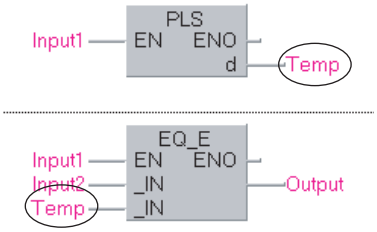
1. **Select [Tool] ⇒ [Options] ⇒ "Compile" ⇒ "Structured Ladder/FBD/ST" ⇒ "Compile Condition1".**

2. **In "Function Output Setting", check the function(s) (PLS and/or PLF) to be set.**
   - If any of these check boxes are not checked, an error occurs when compiling programs.
   - If any of these check boxes are checked, errors and warnings are not displayed when compiling programs.

Example) Creating a program using the PLS output

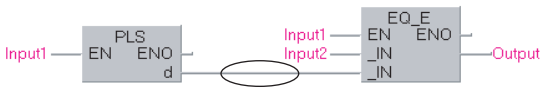
<Check box is not checked>

The output is required to be retained at the label or device.



<Check box is checked>

The output can be connected directly to another input with a line.



10.4.6 Assigning common devices to outputs of function with EN/ENO

Assign common devices to each function, when system devices are automatically assigned to outputs of function with EN/ENO while editing on the structured ladder/FBD/ST editor.

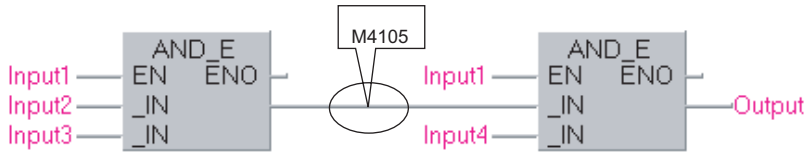
Operating procedure

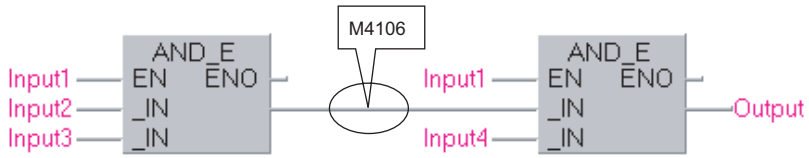
1. **Select [Tool] ⇒ [Options] ⇒ "Compile" ⇒ "Structured Ladder/FBD/ST" ⇒ "Compile Condition3".**

2. **Uncheck the "Automatically assign each system device to output of functions that use EN/ENO" check box.**
   - If the check box is checked, the individual devices are assigned to each function.
   - If the check box is not checked, the same device is assigned to the outputs.

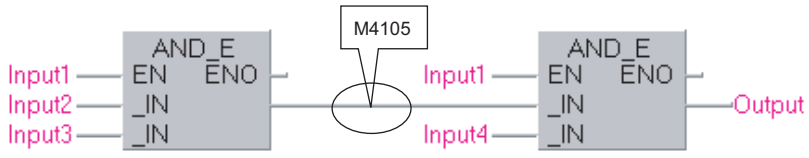
Example) Devices automatically assigned to outputs of function with EN/ENO

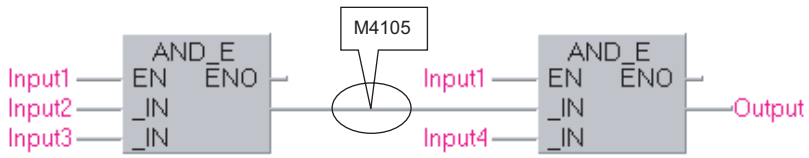
<Check box is checked>
The individual devices are assigned.





<Check box is not checked>
The same device is assigned.





■ Precautions when the check box is not checked

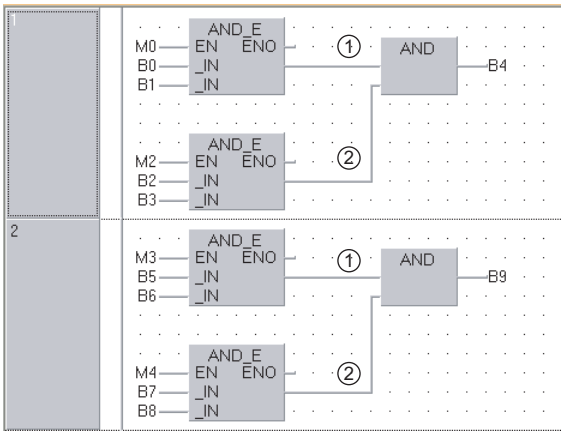
Uncheck the option to save the number of automatically assigned devices to be used.
Take precautions when performing this operation.
The following are the program examples which require precautions.

● Program examples which require precautions

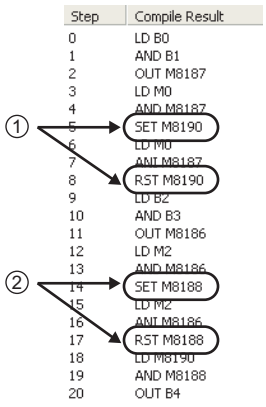
Uncheck the option to assign the same devices to ① and ② as shown below.
However, even M3, M4 are OFF, B9 may be ON since AND instruction without EN/ENO is executed without execution condition.

M8190 is assigned to ①, M8188 is assigned to ② in the following program example.

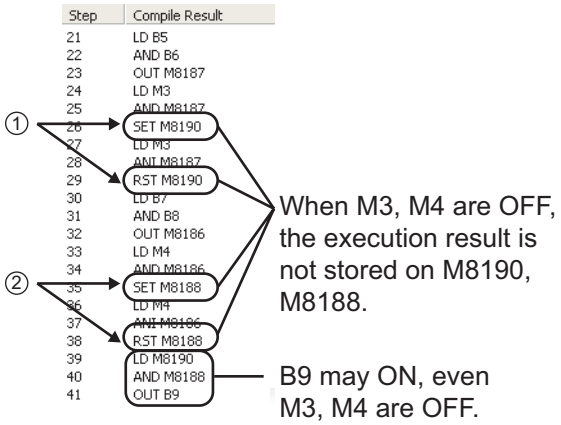
<Example of ladder>



<Compilation result of ladder block 1>



<Compilation result of ladder block 2>

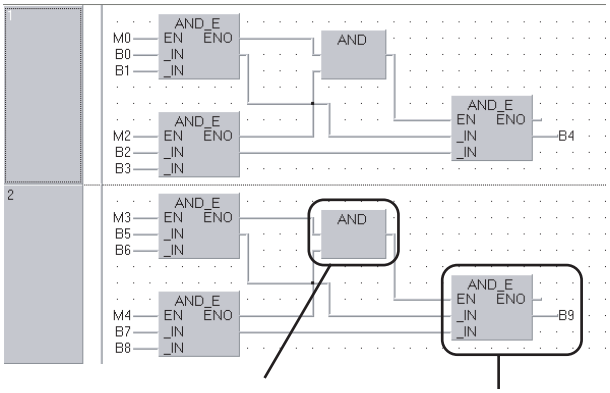


● Example of program which outputs the correct result

Create a program as indicated below to output the correct operation result to B9.

- Use instruction (AND_E) with EN/ENO to output instruction
- Regard logical AND of input (AND_E)'s execution result as output's execution condition (EN) .

<Example of ladder>



Regard logical AND of input (AND_E)'s execution result as output's execution condition.

Use instruction (AND_E) with EN/ENO.

<Compilation result of ladder block 1>

Step	Compile Result
0	LD B0
1	AND B1
2	OUT M8178
3	LD M0
4	AND M8178
5	SET M8182
6	LD M0
7	ANI M8178
8	RST M8182
9	LD B2
10	AND B3
11	OUT M8177
12	LD M2
13	AND M8177
14	SET M8180
15	LD M2
16	ANI M8177
17	RST M8180
18	LD M0
19	AND M2
20	OUT M8179
21	LD M8182
22	AND M8180
23	OUT M8176
24	LD M8179
25	AND M8176
26	SET B4
27	LD M8179
28	ANI M8176
29	RST B4

<Compilation result of ladder block 2>

Step	Compile Result
30	LD B5
31	AND B6
32	OUT M8178
33	LD M3
34	AND M8178
35	SET M8182
36	LD M3
37	ANI M8178
38	RST M8182
39	LD B7
40	AND B8
41	OUT M8177
42	LD M4
43	AND M8177
44	SET M8180
45	LD M4
46	ANI M8177
47	RST M8180
48	LD M3
49	AND M4
50	OUT M8179
51	LD M8182
52	AND M8180
53	OUT M8176
54	LD M8179
55	AND M8176
56	SET B9
57	LD M8179
58	ANI M8176
59	RST B9

Store logical AND of input (AND_E)'s execution result on M8179.

Only when M3, M4 are ON, the operation result is stored on B9.

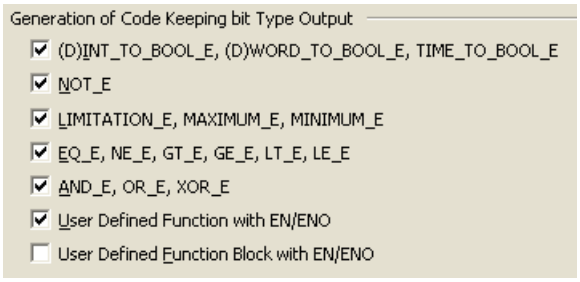
10.4.7 Retaining bit type outputs of functions

Retain bit type outputs of the target function(s).

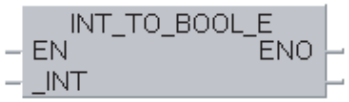
Operating procedure

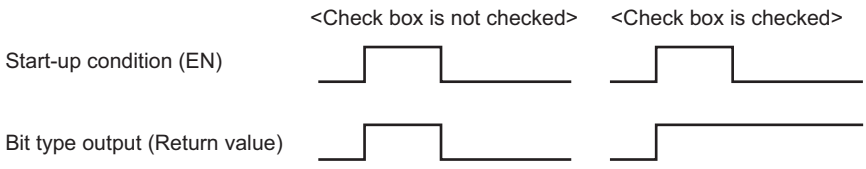
1. **Select [Tool] ⇒ [Options] ⇒ "Compile" ⇒ "Structured Ladder/FBD/ST" ⇒ "Compile Condition2".**

2. **Check the function(s) to be set.**
   - If any of these check boxes are not checked, bit type outputs of function(s) are not retained. (An operation equivalent to the OUT instruction).
   - If the check box(es) is checked, bit type outputs of the function(s) are retained. (An operation equivalent to the SET instruction).


Generation of Code Keeping bit Type Output
(D)INT_TO_BOOL_E, (D)WORD_TO_BOOL_E, TIME_TO_BOOL_E
NOT_E
LIMITATION_E, MAXIMUM_E, MINIMUM_E
EQ_E, NE_E, GT_E, GE_E, LT_E, LE_E
AND_E, OR_E, XOR_E
User Defined Function with EN/ENO
User Defined Function Block with EN/ENO

Example) Retaining the INT_TO_BOOL_E output





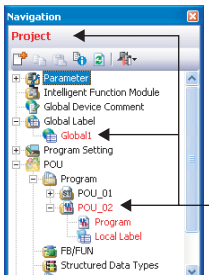
10.5 Compilation

Q CPU L CPU FX

By compilation operation, the labels are assigned to devices, and programs created in project with labels are converted to executable programs in a programmable controller CPU.

● Checking the compilation status

The compilation status can be checked in the Project view. Items are displayed in red as shown below if the data are in uncompiled status.
Uncompiled data can be displayed on the Project view by right-clicking on global label/POU/program file, and selecting [Open Uncompiled Data] from the shortcut menu.
Uncompiled data status is displayed on the Project view.



Items are displayed in red if the data are in uncompiled status.

10.5.1 Compilation target data when compiling all programs

When compiling all programs, compilation target data are determined according to the registration/usage status of data type.
The following table shows the compilation target data.

○: Compiled, ×: Not compiled

Compilation target data type	Registration/usage status of compilation target data type	Compilation target when compiling all programs
Global label data	-	○
Program (program file)	Registered to any of the following programs. . Initial program . Scan program . Wait program . Fixed interval program . No execution type	○
Task	Registered in the program file.	○
Program	Registered in the task.	○
	Not registered in the task.	X
Function block	Declared in the label setting editor.	○
	Not declared in the label setting editor.	X
Function	Used in the program.	○
	Not used in the program.	X
Structure	Declared in the label setting editor.	○
	Not declared in the label setting editor.	X

10.5.2 Assigning devices

Assign the devices set on the Device/Label Automatic-Assign Setting screen during compilation.
In structured ladder/FBD and ST, create actual programs with temporary variable during compilation.
Temporary variable is a device to retain the operation result of programs temporarily, and assign the device within the range set on the Device/Label Automatic-Assign Setting.
Temporary variable is used for such as the following situations.

- Ladders are branched in structured ladder/FBD
- Over 3 items of four arithmetic operations are used in ST
- Other situations which require retaining the operation result temporarily

Temporary variable can be checked by compilation result. (Section 6.2.7)

■ Assigning devices defined on the label setting editor to the labels

The following explains the device assignment to the labels defined on the label setting editor.
For global labels, only labels whose “Device”/ “Address“ are blank on the label setting editor can be assigned.
When both global labels and local labels are assigned, global labels are assigned to devices first, and then local labels are assigned to devices.

● Assigning only one type of device automatically

Assign the devices in top down order on the label setting editor.
Devices are assigned in descending order on the screen (assigned from higher number of a device number) of device range set on the Device/Label Automatic-Assign Setting.
For pointer (P), devices are assigned in ascending order (assigned from lower number of a device number).

Example
<Device automatic-assign setting>
Set the following device range.

- D device: 8000 to 8191

<Label setting>

	Class	Label Name	Data Type
1	VAR	Label_A	Word[Signed]
2	VAR	Label_B	Word[Signed]
3	VAR	Label_C	FLOAT (Double Precision)
4	VAR	Label_D	FLOAT (Double Precision)

<Devices to be assigned to labels>

Definition order	Label name	Data type	Example of devices to be assigned	
1	Label_A	Word (signed)	D8191	Descending order
2	Label_B	Word (signed)	D8190	
3	Label_C	Double-precision real	D8186	
4	Label_D	Double-precision real	D8182	

● Assigning multiple types of device automatically (QCPU (Q mode)/LCPU)

Assign the devices in top down order on the label setting editor.
Devices are assigned in descending order (assigned from higher number of a device number) of device range set on the Device/Label Automatic-Assign Setting.
When the number of devices is less than the number of devices required for one label, devices are assigned in descending order of the next device's device range.
When the following label requires the devices which are within the above device range, the previous devices which are not assigned yet are assigned.

Example 1
<Device automatic-assign setting>
Set the following device range.
• D device: 8000 to 8002
• ZR device: 0 to 1023

<Label setting>

	Class	Label Name	Data Type
1	VAR	Label_A	Word[Signed]
2	VAR	Label_B	Word[Signed]
3	VAR	Label_C	FLOAT (Double Precision)
4	VAR	Label_D	FLOAT (Double Precision)

<Devices to be assigned to labels>

Definition order	Label name	Data type	Example of devices to be assigned	
1	Label_A	Word (signed)	D8002	Descending order
2	Label_B	Word (signed)	D8001	
3	Label_C	Double-precision real	ZR1020*1	
4	Label_D	Double-precision real	ZR1016	

*1 : Since double-precision real requires four devices, one device of D8000 is not enough. Therefore, the next device ZR is assigned.

Example 2
<Device automatic-assign setting>
Set the following device range.
• D device: 8000 to 8002
• ZR device: 0 to 1023

<Label setting>

	Class	Label Name	Data Type
1	VAR	Label_A	Word[Signed]
2	VAR	Label_B	FLOAT (Double Precision)
3	VAR	Label_C	Word[Signed]
4	VAR	Label_D	FLOAT (Double Precision)

<Devices to be assigned to labels>

Definition order	Label name	Data type	Example of devices to be assigned	
1	Label_A	Word (signed)	D8002	Descending order
2	Label_B	Double-precision real	ZR1020*1	
3	Label_C	Word (signed)	D8001*2	
4	Label_D	Double-precision real	ZR1016*3	

*1 : Since double-precision real requires four devices, two device of D8000 to D8001 are not enough. Therefore, the next device ZR is assigned.

*2 : Since word (signed) requires one device, D8001 can be assigned. Therefore, return to the previous device (D device), and the device is assigned to the label.

*3 : Since double-precision real requires four devices, one device of D8000 is not enough. Therefore, the next device ZR is assigned.

■ Assigning to temporary variable (automatically assigned device to other than label)

Assign a device to temporary variable.

● When the type of device to be assigned is one (QCPU (Q mode)/LCPU)

Devices are assigned in descending order (assigned from higher number of a device number) of device range set on the Device/Label Automatic-Assign Setting in the same manner as the assignment to a label defined in a label setting editor.

● When the multiple types of devices are assigned automatically

Select one device to be assigned from devices set on the Device/Label Automatic-Assign Setting with the order of ZR → R → W → D/B → M.
Multiple device types are not assigned to temporary variable.

Example 1
<Device automatic-assign setting>
Set the following device range.
• D device: 8000 to 8191
• ZR device: 0 to 1023
<Device to be assigned>
Assign ZR for temporary variable

Example 2
<Device automatic-assign setting>
Set the following device range.
• D device: 8000 to 8191
• W device: 0 to 1023
<Device to be assigned>
Assign W for temporary variable.

■ Checking points of the empty automatically assigned device

The usage of devices within the range set on the Device/Label Automatic-Assign Setting can be checked by searching devices within the automatically assigned device range with the Device List.

Example
When 4000 to 8191 of D device are set on the Device/Label Automatic-Assign Setting, search D4000 to D8191 with the Device List.
The range of number of empty device points is the devices before the device numbers being used among D4000 to D8191 (*).
For example, if D5000 to D8191 are used, D4000 to D4999 are the number of empty device points within the range set on the Device/Label Automatic-Assign Setting.

For details of Device List, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Common)

10.5.3 Precautions on Compilation

● When the multiple types of devices are assigned automatically (QCPU (Q mode)/LCPU)

If a program or label is changed and executed “Build” repeatedly, the number of used devices is increased and that of assignable devices is decreased since the devices assigned once cannot be used. Execute “Rebuild All”.
When D, W, R, ZR are selected as automatically assigned device concurrently, devices are assigned from D, W. If the number of D, W is not enough, devices are assigned from R, ZR.
Note that the control timing may change depending on the program content since the operation processing times of D, W and R differ from that of ZR.
For details of operation processing time, refer to the following manual.
☞ MELSEC-Q/L Structured Programming Manual (Common Instructions)

● When ZR is added to automatically assigned device after compilation (QCPU (Q mode)/LCPU)

Temporary variable assigns only one type of devices, however, when ZR device is added to automatically assigned device after compilation, ZR device is assigned by recompilation.
Operation processing time may differ depending on the program content.
Increase the device range other than ZR to avoid the change of operation processing time.

● When array type labels are used

When devices/labels are used for indexes in array type labels, the compilation result is created with the devices shown below.
Note that the device values may be overwritten when the following devices are used in user programs.

- Basic model QCPU, High Performance model QCPU: Z0, Z1
- Universal model QCPU, LCPU: Z16 to 19
- FXCPU: Z0, V0

● Compiling programs when adding/changing labels

When programs are compiled after adding/changing labels, devices are reassigned to labels in uncompiled POUs only. Since previous device values may remain among the devices reassigned to labels, clear the previous device values by the following procedure when adding/changing labels.

Operation

1. Add/change labels only.
   (Do not edit the programs.)
2. Select [Compile] ⇒ [Build], and compile the programs.
3. Register added/changed labels to the Watch window and clear the current values to 0.
4. Edit the programs and select [Compile] ⇒ [Online Program Change].

● Assigning devices to labels when compiling all programs

All programs need to be compiled when the following operations are performed.

- Changing the following PLC parameters[*1]
  - "Common Pointer No." and "Timer Limit Setting" on the <<PLC System>> tab
  - "File Register" and "File for Local Device" on the <<PLC File>> tab
  - Settings on the <<Device>> tab
- Changing the following option settings
  - "Default Length of String Data Type" in "Label Setting Editor"
  - Settings in "Compile"
- Changing automatically assigned devices
- Updating instructions and application functions when opening Structured project.

- Changing PLC type
- Changing project type
- Reading data from programmable controller CPU (except for when reading symbolic information and parameters at the same time)
- Reading data written to the programmable controller CPU by GX Developer or GX IEC Developer
- Using Open Other Project function

When all programs are compiled, devices are reassigned to labels in all POUs. If all the compiled programs are written to the programmable controller CPU and run as they are, the programs may be processed with the device values set before the program change.
After compiling all programs, clear the device values set before the program change by the following procedure.
Note that, by setting the following option, device values in the range set in the device/label automatic-assign setting can be automatically cleared to 0 after writing programs to the programmable controller CPU.

- [Tool] ⇒ [Options] ⇒ "When writing to PLC after a Rebuild All operation, clear the device ranges set in the Device/Label Auto-Assign setting to 0."

*1 : QCPU (Q mode)/LCPU only

• QCPU (Q mode)/LCPU

Operation

1. Switch the programmable controller CPU to STOP.
2. Select [Online] ⇒ [Write to PLC], and write programs to the programmable controller CPU.
3. Switch the programmable controller CPU to RESET.
   It can also be reset by selecting [Compile] ⇒ [Remote Operation].
4. Select [Online] ⇒ [PLC Memory Operation] ⇒ [Clear PLC Memory] to clear the memories.
   If VAR_RETAIN is used in the [Device/Label Automatic-Assign Setting], clear all device memories including latches.
   If file registers are used in the [Device/Label Automatic-Assign Setting], clear all file registers.

• FXCPU

Operation

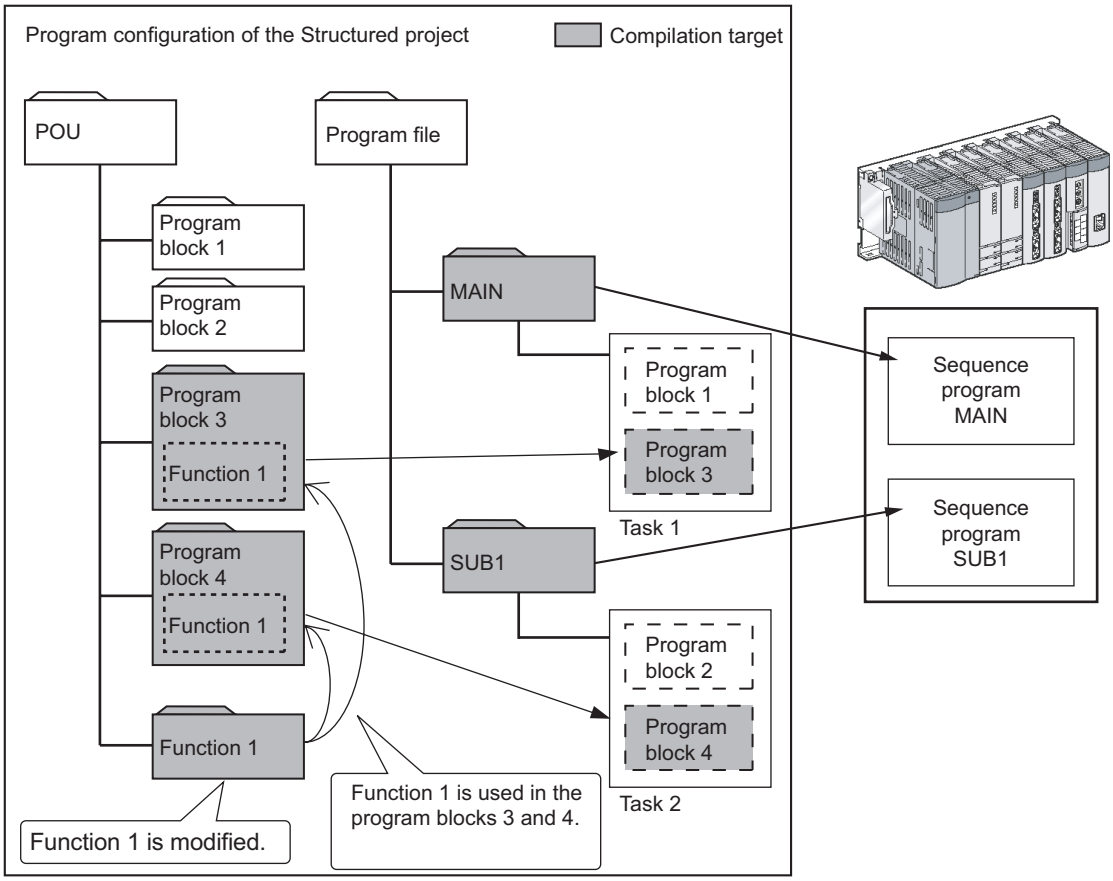
1. Switch the programmable controller CPU to STOP.
2. Select [Online] ⇒ [Write to PLC], and write programs to the programmable controller CPU.
3. Select [Online] ⇒ [PLC Memory Operation] ⇒ [Clear PLC Memory] to clear the device memories.

The remote RUN function when writing data to programmable controller CPU after compiling all programs can be disabled by setting the following option. Check "Turn PLC to STOP at time of PLC write after executing Rebuild All and do not execute remote RUN" under [Tool] ⇒ [Options] ⇒ [PLC Read/Write].

● Modification of global labels and functions/function blocks

If global labels and/or functions/function blocks are modified, multiple program blocks become the compile targets. Write all program files of the compile targets to the programmable controller CPU to apply the modifications.

Example) Compiling programs after modifying Function 1 in the following program configuration. Program blocks 3 and 4 are compiled and the program files MAIN and SUB1 are modified.



● Device/label automatic-assign setting

Devices in the range set on the Device/Label Automatic-Assign Setting screen (automatically assigned devices) cannot be used in the program.
If automatically assigned devices are used in a program, a compilation error occurs.
(For the device/label automatic-assign setting ☞ Section 5.7)

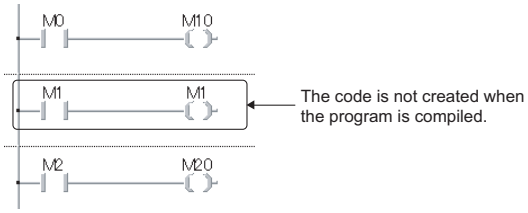
● Input arguments of function/function block

Data cannot be written to input arguments (VAR_INPUT) of function/function block.
If data are written to input arguments, a compilation error occurs.

● Compiling structured ladder/FBD/ST programs

The code is not created when the program as shown below is compiled in the structured ladder/FBD or ST program.

Example) The same device is used for a contact and coil

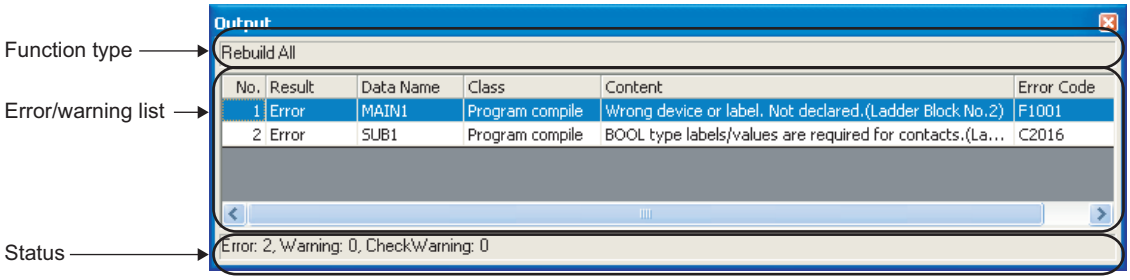


10.6 Checking for Errors and Warnings

Q CPU L CPU FX

When the program check or the compilation is executed, the target programs and label settings are checked and the results are displayed on the Output window.
The following explains how to check the errors displayed on the Output window.

Screen display


Function type
Error/warning list
Status
Output
Rebuild All
No. Result Data Name Class Content Error Code
1 Error MAIN1 Program compile Wrong device or label. Not declared.(Ladder Block No.2) F1001
2 Error SUB1 Program compile BOOL type labels/values are required for contacts.(La... C2016
Error: 2, Warning: 0, CheckWarning: 0

Display contents

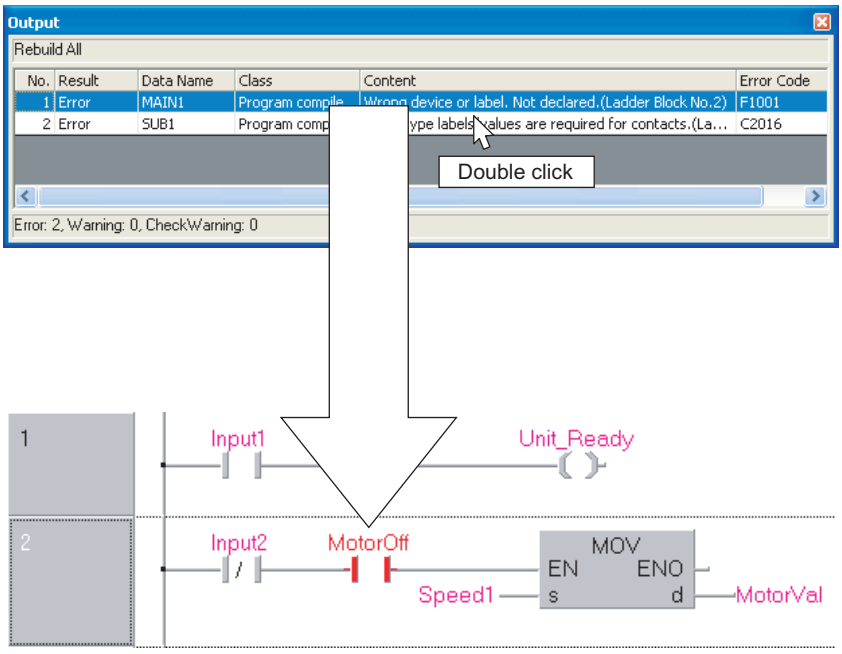
Item		Description
Function type		Display the name of the executed function.
Error/warning list		-
	Result	Display the check results. Display "Error" and "Warning". Display "Check Warning" for the duplicated coil check/ladder check/consistency check warnings.
	Data Name	Display project names with errors and warnings.
	Class	Display check types such as the compilation and program check.
	Content	Display descriptions of errors and warnings.
	Error Code	Display error code numbers.
Status		Display the total number of errors and warnings.

10.6.1 Correcting errors and warnings

Check and correct errors/warnings.

Operating procedure

1. **Double-click the error/warning message displayed on the Output window.**
   The corresponding error location in the program is displayed.



2. **Check the corresponding error location and correct the error as instructed by the error/warning message.**

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11 WRITING/READING DATA TO/ FROM PROGRAMMABLE CONTROLLER CPU

This chapter explains how to write/read sequence programs to/from the programmable controller CPU or memory card.

For the overview of the data write/read operation, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Common)

11.1 Writing/Reading Data to/from Programmable Controller CPU 11-2

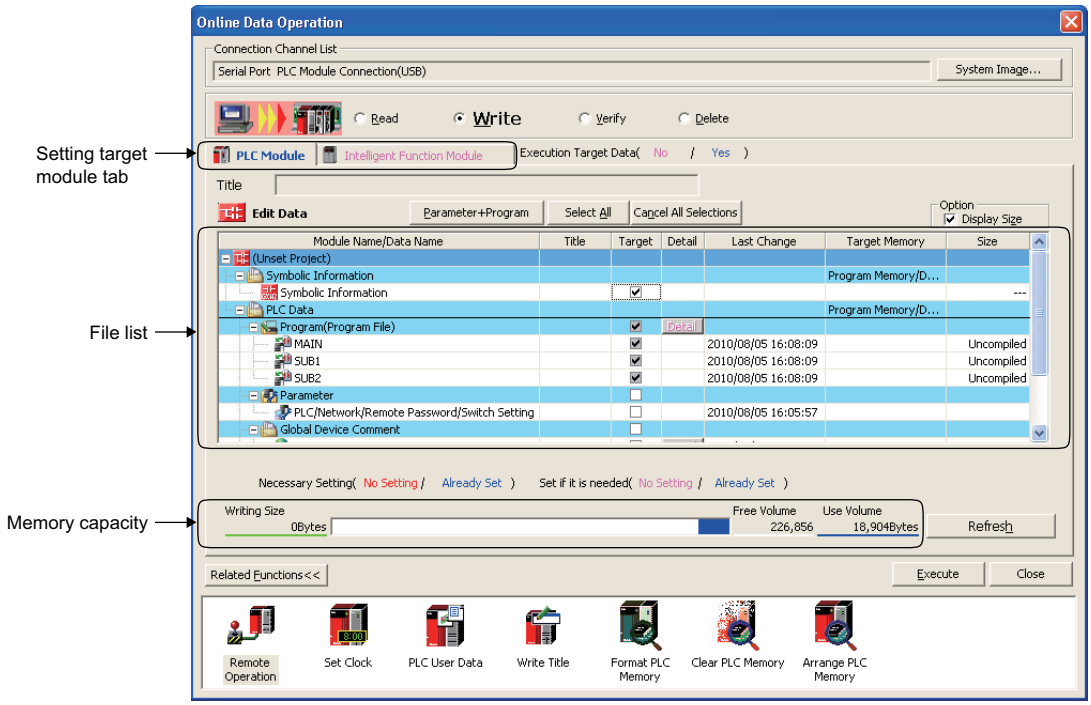
11.1 Writing/Reading Data to/from Programmable Controller CPU

Q CPU L CPU FX

This section explains how to write the Structured project data to the programmable controller CPU or memory card, and how to read the data from the programmable controller CPU or memory card to the project.
Symbolic information can be written to/read from a programmable controller CPU for projects with labels of FX3U/FX3UC version 3.00 or later only.

Screen display

Select [Online] ⇒ [Write to PLC] ( )/[Read from PLC] ( ).
For QCPU (Q mode)/LCPU/FXCPU (FX3U/FX3UC version 3.00 or later), symbolic information is displayed on the file list.



Operating procedure

1. Set the items on the screen.

Item			Description
Connection Channel List			Display the information on the set connection target.
Setting target module tab			Switch the setting target module. If the target data of write/read exists, the color of the tab name is displayed in blue.
	PLC Module		Set to write the data to the programmable controller CPU.
	Intelligent Function Module*1		Set to write the data of the intelligent function module to buffer memory/flash ROM of the intelligent function module. ☞ GX Works2 Version 1 Operating Manual (Common)
Title*1			Display the title of the target memory by clicking the Refresh button.
Option*1			-
		Display Size	Check this to display "Size" and memory capacity in the file list.
File list			-
		Target	Select the data to be written/read.
		Target Memory*1	Select the memory from the list (▼) by clicking the cell under "Target Memory". For details of the memory card application, refer to the following manual. ☞ User's Manual (Hardware Design, Maintenance and Inspection) of the CPU module to be used
Memory capacity*2			-
		Writing Size	Display the total size of written data checked in "Target".
		Free Volume	Display the free space volume of the target memory.
		Use Volume	Display the used space volume of the target memory.

*1: Not supported by FXCPU.

*2: For FXCPU, program size and symbolic information data size are displayed when executing the Write to PLC function. Symbolic information size is displayed on the screen for projects with labels of FX3U/FX3UC version 3.00 or later only.

When a program (program file), device comment, or device memory is selected, the range can be set by clicking the Detail / Detail button.
When reading data from the programmable controller CPU, and the device memory is selected, the detailed settings are required.
For details, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Common)

2. Click the Execute button.

When the Write to PLC function is executed, the specified data are written to the target memory.
When the Read from PLC function is executed, the specified data are read from the target memory.

Screen button

- System Image...

  Displays the illustration of the connection channel list.

- Parameter + Program

  Selects the parameters and all programs displayed on the list.

- Select all

  Selects all data displayed on the list.

- Cancel all selections

  Cancels the selection status of all data displayed on the list.

- Related Functions>> / Related Functions<<

  Switches display/hide of the Related functions button.
  For details of the related functions, refer to the following manual.
  ☞ GX Works2 Version 1 Operating Manual (Common)

- Acquire Symbolic Information Project Name (Read from PLC, Delete PLC Data only)

  Displays the project name of the symbolic information in the Title/Project Name column.

- Refresh

  Updates data list on the Online Data Operation screen.
  For QCPU (Q mode)/LCPU, updates writing size, free space volume, and used space volume.
  When multiple personal computers are connected to the programmable controller CPU, update the target memory before reading data from the programmable controller CPU.

■ Symbolic information

The symbolic information is data that store the program configuration such as structures and labels. To restore these data included in the symbolic information when reading a program from the programmable controller CPU, write/read the symbolic information to/from the programmable controller CPU.
Data such as structures and labels included in the symbolic information cannot be restored if only sequence programs are read. (Data are treated as the ladder in Structured projects.)

The following table shows the program data included in the symbolic information.

Item	Included data	
Symbolic information	Global label	
	Program setting	
		Task
	POU	
		Program
		Local label
		Function block
		Function
		Structure
	User library	

Point

- **Compile status when the symbolic information is read**
  - When the symbolic information and parameters are read simultaneously, and the data in the symbolic information match with parameters and programs (program files) in the programmable controller CPU, the read data are in compiled status. When only the symbolic information is read, the read data are in uncompiled status.
  - When the symbolic information of GX Developer or GX IEC Developer is read, the read data are in uncompiled status. Compile the program again after executing the Read from PLC function.
- **Precautions for reading symbolic information**
  For the precautions for reading label programs (symbolic information) of the existing application using GX Works2, or reading label programs (symbolic information) of GX Works2 using the existing application, refer to the following manual.
  (☞ GX Works2 Version 1 Operating Manual (Common))
- **For FXCPU**
  - The symbolic information data can be read from/written to the programmable controller CPU in FX3U and FX3UC version 3.00 or later only.
  - When a memory cassette to which the symbolic information has been written is used on an FXCPU other than FX3U/FX3UC version 3.00 or later, the symbolic information may be corrupted.
- **Saving project automatically after writing data to programmable controller CPU**
  A project can be saved automatically after writing data to the programmable controller CPU by setting the option. Check the "Save project after writing to PLC" item under [Tool] ⇒ [Options] ⇒ "Project" ⇒ "Automatic Save".

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12 MONITORING

This chapter explains how to monitor the program execution status of the programmable controller CPU using the program editor.
For the overview of monitoring, refer to the following manual.
☞GX Works2 Version 1 Operating Manual (Common)

12.1 Starting and Stopping Monitoring of Program 12-2
12.2 Starting and Stopping Monitoring of Function Blocks . . . 12-3
12.3 Changing Operating Conditions of Monitoring 12-4
12.4 Monitoring Programs on ST Editor 12-6
12.5 Monitoring Programs in Structured Ladder/FBD Editor . . 12-8

12.1 Starting and Stopping Monitoring of Program

Q CPU L CPU FX

This section explains how to monitor a program on the program editor.
Open the program editor to be monitored in advance.

■ Starting monitoring of programs

Start monitoring of the program.

Operating procedure

- Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ( ).
  The monitoring starts.

■ Stopping monitoring of programs

Stop monitoring of the program.

Operating procedure

- Select [Online] ⇒ [Monitor] ⇒ [Stop Monitoring] ( ).
  The monitoring stops.

Point

- **Changing current values**
  During monitoring, bit devices can be forced ON/OFF, and the current values of devices, buffer memories, and labels can be changed.
  For forcing bit devices ON/OFF and changing current values, refer to the following manual.
  ☞ GX Works2 Version 1 Operating Manual (Common)
- **Monitoring buffer memory and link memory**
  To monitor the ON/OFF status of the buffer memory and link memory (example: U0\G0.1), select [Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "Structured Ladder/FBD/ST" ⇒ "Operational Setting" and check "Monitor buffer memory and link memory".
- **Monitoring labels whose classes are set as a constant type**
  For labels whose classes are set as VAR_GLOBAL_CONSTANT, VAR_CONSTANT, the values are not displayed during monitoring.
  To check the values, select "Constant Value" under [Tool] ⇒ [Options] ⇒ "Program Editor" ⇒ "Structured Ladder/FBD/ST" ⇒ "Tool Hint" ⇒ "Tool Hint Display Items", and check with tool hint.

12.2 Starting and Stopping Monitoring of Function Blocks

Q CPU L CPU FX

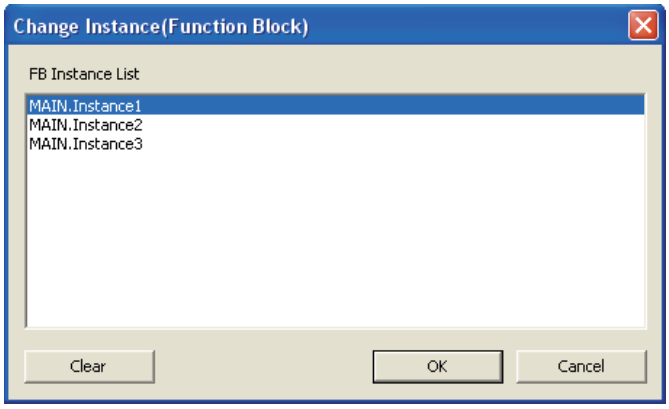
This section explains how to monitor function block programs.
Open the function block program to be monitored in advance.

■ Starting monitoring of function blocks

Start monitoring of the function block.

Operating procedure

1. **Select [Online] ⇒ [Monitor] ⇒ [Change Instance (Function Block)].**
   The Change Instance (Function Block) screen is displayed.



2. **Select the FB instance to be monitored.**
3. **Click the OK button.**
4. **Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring] ( ).**
   The monitoring starts.
   The display and executable operations during monitoring are the same as those of the program monitoring.

Screen button

- Clear
  Cancels the selected status of the FB instance and stops monitoring.

■ Stopping monitoring of function blocks

Stop monitoring of the function block.

Operating procedure

- Select [Online] ⇒ [Monitor] ⇒ [Stop Monitoring] ( ).
  The monitoring stops.

12.3 Changing Operating Conditions of Monitoring

Q CPU L CPU FX

This section explains how to change the operating conditions of monitoring.

12.3.1 Changing current value display format (decimal/ hexadecimal) of word type variable

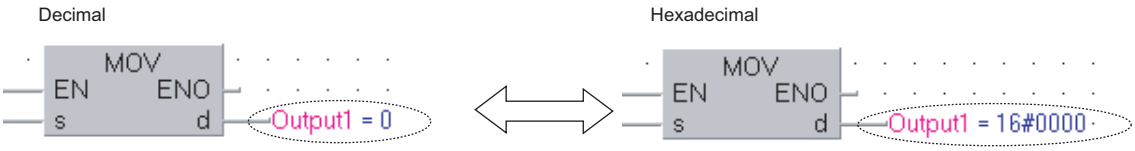
Change the current value display format of word and double word type variable displayed during monitoring.

■ Changing display format during monitoring

Change the current value display format of word and double word type variable during monitoring.

Operating procedure

- Select [Online] ⇒ [Monitor] ⇒ [Change Value Format (Decimal)] / [Change Value Format (Hexadecimal)].

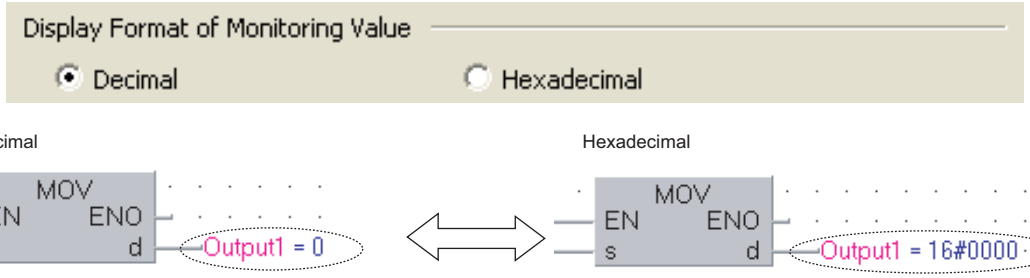


■ Changing display format before starting monitoring

Change the current value display format by setting the option.
The monitoring starts with the set display format.

Operating procedure

- Select [Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "Structured Ladder/FBD/ST" ⇒ "Display Format of Monitoring Value" ⇒ "Decimal"/"Hexadecimal".



12.3.2 Setting the number of displaying characters for character strings

Set the number of displaying characters for the monitoring result of character strings by setting the option on the structured ladder/FBD and ST editors.

Operating procedure

1. **Select [Tool] ⇒ [Options] ⇒ "Monitor" ⇒ "Structured Ladder/FBD/ST" ⇒ "Character String Monitor Setting".**

2. **Set the number of displaying characters within the range from 2 to 50.**

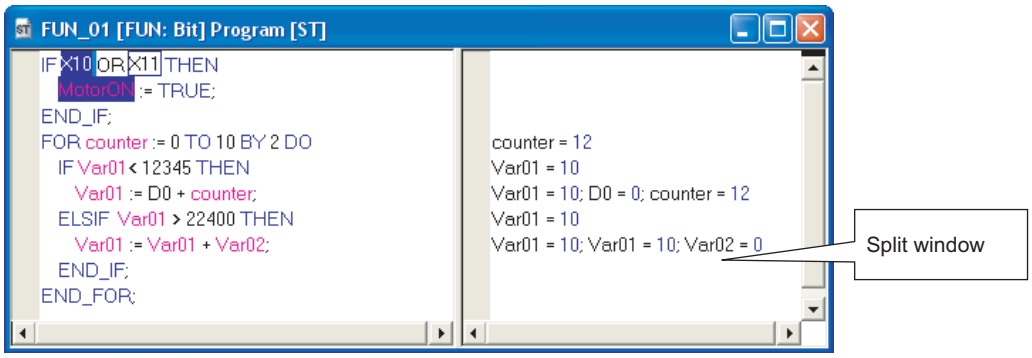
12.4 Monitoring Programs on ST Editor

Q CPU L CPU FX

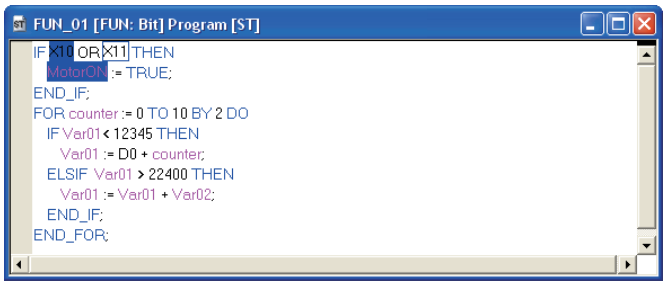
This section explains the display of the ST editor at the monitoring.

Screen display

Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring].

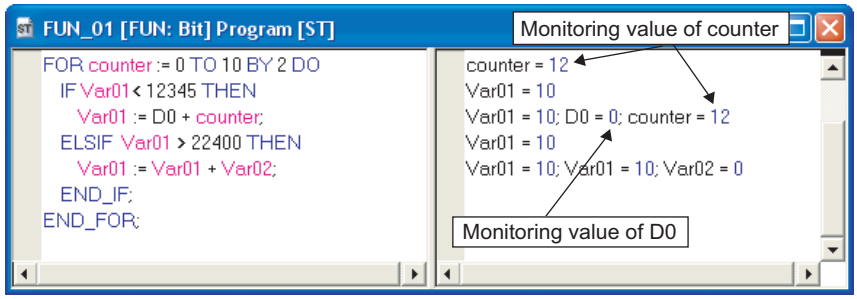


Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring (Bit Type only)].



■ Monitoring labels other than bit type labels and word devices

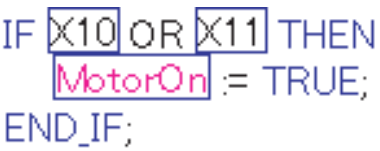
The monitoring values of labels other than bit type labels and word devices are displayed on the right side of the split window.



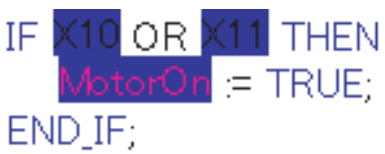
■ Monitoring bit type labels and bit devices

The following shows the display of bit type labels and bit devices at the monitoring.

<FALSE>



<TRUE>



Point

● **Displaying monitoring values**

When the labels are used for array element, or when the elements are not specified for array or structured data type, the monitoring values are not displayed correctly. The monitoring values on tool hint are not displayed correctly either.

Monitoring values of each element for array or structured data type can be checked on the Watch window.

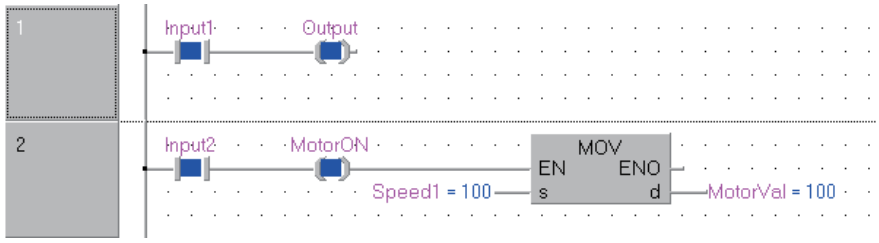
12.5 Monitoring Programs in Structured Ladder/FBD Editor

Q CPU L CPU FX

This section explains the display of the structured ladder/FBD editor at the monitoring.

Screen display

Select [Online] ⇒ [Monitor] ⇒ [Start Monitoring].



■ Monitoring contacts and coils

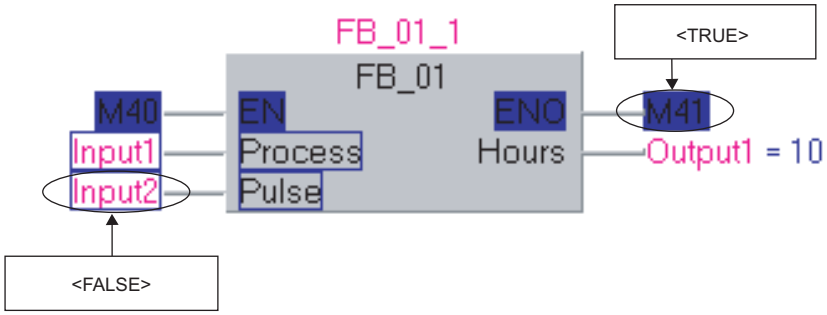
The following shows the display of contacts and coils at the monitoring.

<FALSE>

<TRUE>

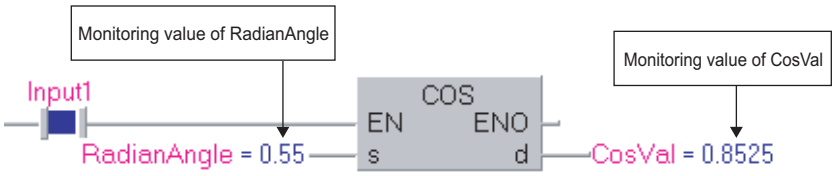
■ Monitoring bit type labels and bit devices

The following shows the display of bit type labels and bit devices at the monitoring.



■ Monitoring labels other than bit type labels and word devices

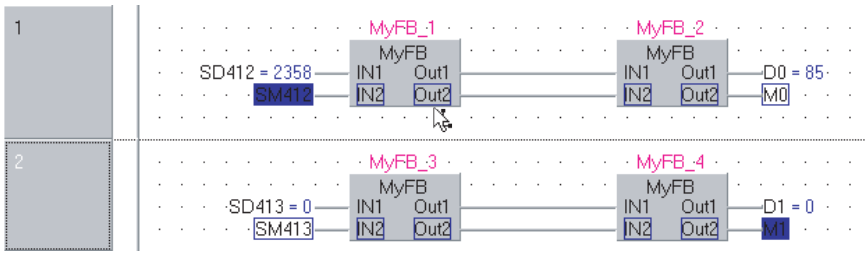
The monitoring values of labels other than bit type labels and word devices are displayed to the right of the corresponding labels or devices.



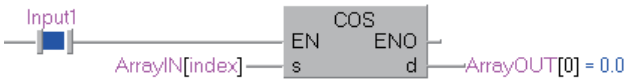
Point

● **Displaying monitoring values**

- Monitoring values of FB I/O arguments can be checked with the tool hint.
  For the display method of the tool hint, refer to Section 6.2.8.



- When the labels are used for array element, or when the elements are not specified for array or structured data type, the monitoring values are not displayed. The monitoring values on tool hint are not displayed either.
  In this case, check monitoring values of array or structured data type on the Watch window.



MEMO

13 USING USER LIBRARIES

In Structured project, user libraries are shared among multiple projects as program assets.
This chapter explains the user library operating methods.

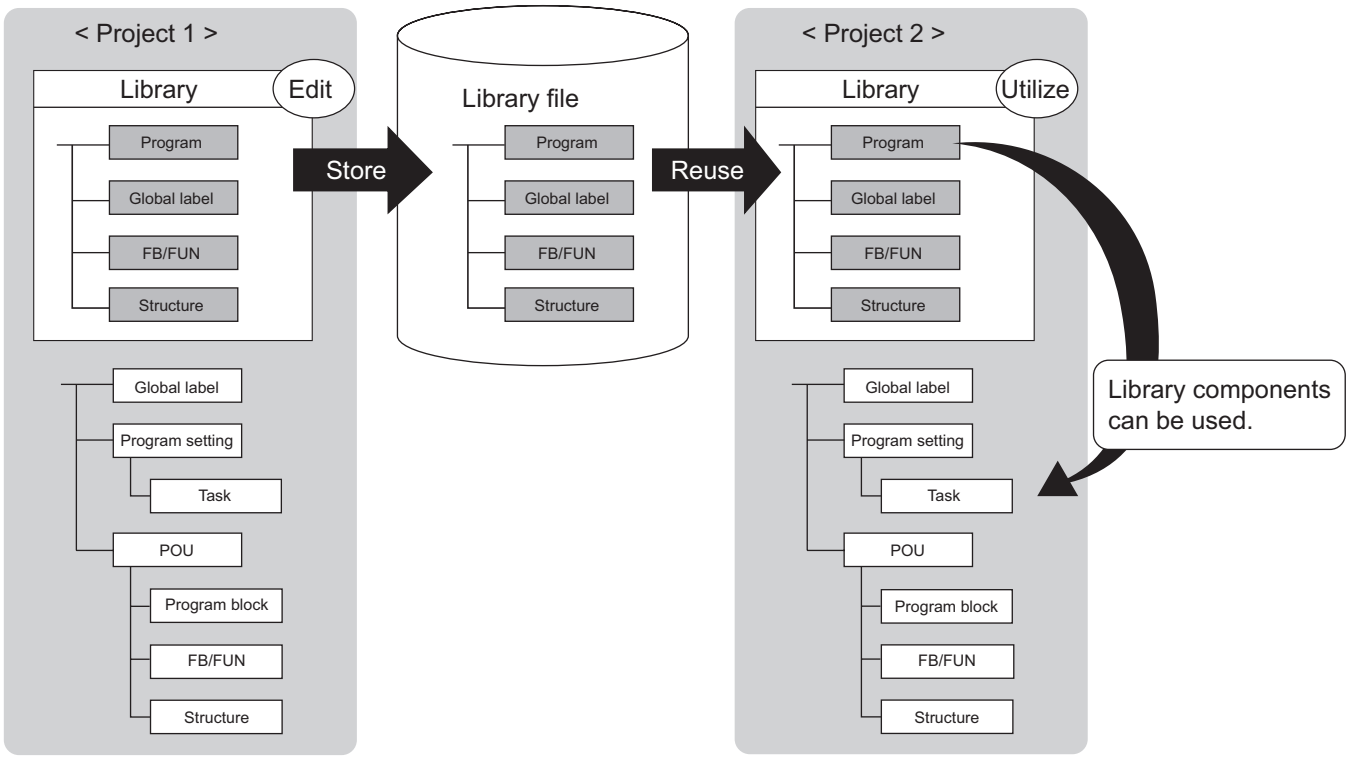
13.1 User Libraries 13-2
13.2 Procedure for Using User Library 13-3
13.3 Creating User Library 13-4
13.4 Using User Library 13-11

13.1 User Libraries

Q CPU L CPU FX

User libraries are components which can be shared between multiple projects and can be used in Structured project only.
These libraries are created by the user.

Frequently-used components are stored and reused for programming efficiency.



The following data can be registered to user libraries.

- Global labels
- Structured data
- POUs (program blocks, functions, function blocks)

13.2 Procedure for Using User Library

Q CPU L CPU FX

This section explains how to create a user library.
POUs created in a user library can be shared among multiple projects.
The following explains how to utilize a created user library to other projects.

1. Create a user library.

Procedure	Reference
Create a new user library.	Section 13.3.1
Create data for user library.	Section 13.3.3
Save the user library under a specified name.	Section 13.3.4

2. Utilize the library.

Procedure	Reference
Utilize the user library to a project.	Section 13.4.1
Create a program using the user library.	Section 13.4.2

3. Edit the user library and update the library file data.

Procedure	Reference
Change the setting to enable or disable editing of the utilized user library data.	Section 13.4.3
Update the user library data.	Section 13.4.4

13.3 Creating User Library

Q CPU L CPU FX

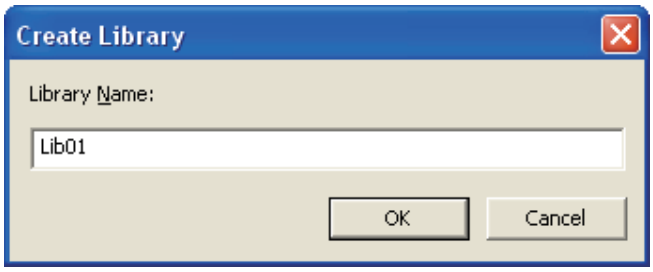
This section explains how to create a user library.

13.3.1 Creating user libraries

Create a new user library.
Select the User Library view of the Navigation window and follow the operation below.

Screen display

Select [Project] ⇒ [Library] ⇒ [Create] ( ).



Operating procedure

1. **Enter a library name.**

2. **Click the OK button.**
   A user library is created and displayed on the User Library view.

Point

- **Maximum number of user libraries**
  - The maximum number of user libraries that can be created in a project is 800.
- **Number of characters for a library name**
  - The maximum number of characters that can be entered for a library name is 32.
- **Invalid characters for library names**
  - For invalid characters for library names, refer to the following manual.
    ☞ MELSEC-Q/L/F Structured Programming Manual (Fundamentals)

13.3.2 Changing library name

Change the user library name.

Operating procedure

1. **Select a library name to be renamed in the User Library view.**
2. **Select [Project] ⇒ [Library] ⇒ [Rename].**
   The editing of the library name in the project tree is enabled.
3. **Set the library name.**
   Press the Enter key to confirm the new library name.

13.3.3 Creating data

Create data for the user library.

■ Adding data

Add new data (programs, global labels, functions/function blocks, structures) to the user library.
For details of adding new data, refer to the following manual.
☞ GX Works2 Version 1 Operating Manual (Common)

Point

- **Global labels**
  Labels defined by global labels in the User Library view can be used in programs in the Project view.
  Labels defined by global labels in the Project view can also be used in programs in the User Library view.
- **System labels**
  Global labels in the User Library view cannot be registered to the system label data base.

■ Editing data

Edit data (programs, global labels/local labels, functions/function blocks, structures).
For details of editing data, refer to Chapter 5 through Chapter 8.

13.3.4 Saving library file

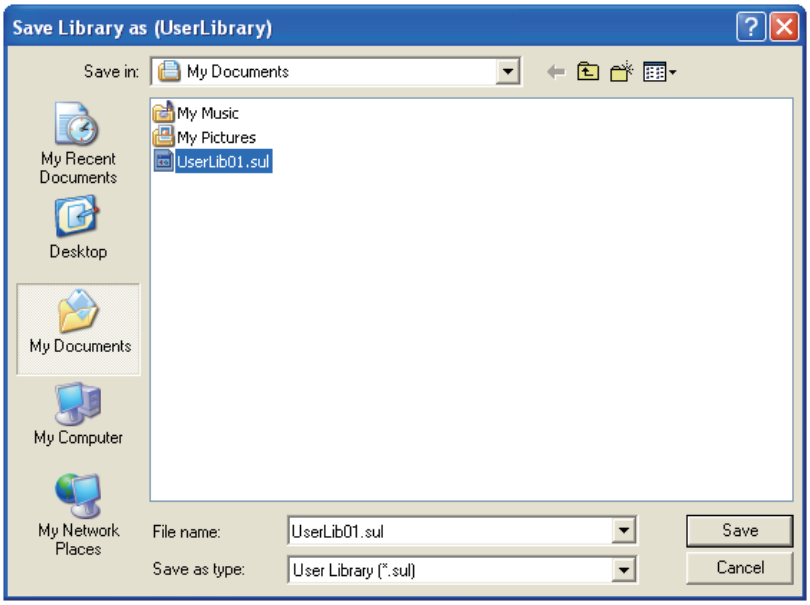
Save a user library to a library file.
A library file can be also saved with a different library name.

■ Saving user library under specified name

Save the user library under a specified name.

Screen display

Select [Project] ⇒ [Library] ⇒ [Save As].



Operating procedure

1. **Select a library name to be saved in the User Library view. (Multiple libraries can be selected.)**

2. **Select [Project] ⇒ [Library] ⇒ [Save As].**
   The Save Library as screen is displayed.

3. **Set a file name.**

4. **Click the** Save **button.**
   The user library data are saved to the library file.

■ Saving library files

Save the user library in the library file.

Operating procedure

1. **Select a library name to be saved in the User Library view. (Multiple libraries can be selected.)**

2. **Select [Project] ⇒ [Library] ⇒ [Save].**
   The user library data is saved in the library file.

Point

- **Identifying the saved library file**
  A saved library file is identified with the path and file name which are specified when the file was saved with a specified name previously, or installed to the project.
- **Applying file changes to other projects**
  To apply the changes to library files in other projects, update the user libraries in each project in advance.
  (☞ Section 13.4.4)

13.3.5 Deleting user library from project

Delete a user library from the project.

Operating procedure

1. **Select a library name to be deleted in the User Library view. (Multiple libraries can be selected.)**

2. **Select [Project] ⇒ [Library] ⇒ [Deinstall].**
   The selected data is deleted.

Point

● **Deleting user library**
- The saved library file is not deleted even if a user library is deleted.
- All POUs using the deleted library file become in the uncompiled status. Compile the program again.

13.3.6 Setting password to user library

Set a password to protect data in the user library.
Once the password is set, programs in the POUs are hidden on the screen. Structures, global labels, and local labels are displayed.

Screen display

Select [Project] ⇒ [Library] ⇒ [Change Password].

Operating procedure

1. **Set the items on the screen.**

Item		Description
Library Name		Display a library name to which a password is set.
Password Setup		Set a password.
	Old Password	Enter a previous password. Leave the field blank when setting a password for the first time.
	New Password	Enter a new password.
	Confirm Password	Re-enter a new password for confirmation.

2. **Click the [OK] button**

Point

- **Password**
  Set a password within 14 characters using alphanumeric characters and symbols correspond to the ASCII code 20H to 7EH. For details of ASCII code, refer to the following manual.
  ☞ GX Works2 Version 1 Operating Manual (Common)
- **Libraries saved in library files**
  If a user library is saved in the library file, the password setting is also saved.
  Library files must be managed carefully if they are shared with multiple projects.
- **Editing status**
  Before using this function, enable the editing of the user library. (☞ Section 13.4.3)

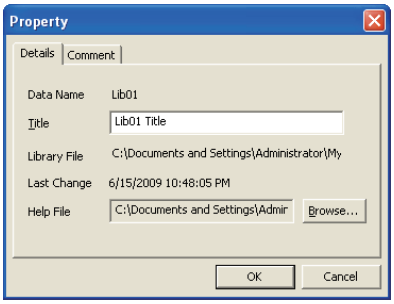
13.3.7 Set help file to library

Set a help file to the library.
Specified files created in the following formats can be set as help data.

- Windows help file (*.hlp)
- HTML help file (*chm)
- Text file (*txt)

Operating procedure

1. **Select a user library to which a property is set, and select [Project] ⇒ [Object] ⇒ [Property] ( ).**
   The Property screen is displayed.



2. **Click the [Browse...] button.**
   The Open a help file screen is displayed.

3. **Select a file to be set.**
   The path and name of the selected help file are displayed on the Property screen.

4. **Click the [OK] button.**
   The specified help file is set as the user library help.

13.4 Using User Library

Q CPU L CPU FX

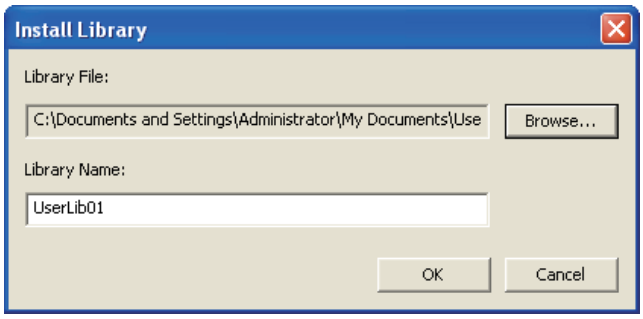
This section explains how to use a created user library.

13.4.1 Installing user library data to project

Install user library data from the existing library file to the project.

Screen display

Select [Project] ⇒ [Library] ⇒ [Install].



Operating procedure

1. **Set the items on the screen.**

Item	Description
Library File	Set a path of the library file to be installed. Click the Browse... button, and select a folder in the Open Library screen.
Library Name	Enter a library name.

2. **Click the OK button.**

   The selected library file data are installed and the library name is displayed on the User Library view.

Point

● **Maximum number of user libraries**
The maximum number of user libraries that can be created in a project is 800.

13.4.2 Creating programs using user library

Use data in a user library to create programs in a project.

■ Using user library data: programs

Use programs in a user library by registering them to a task.
For details of registering programs to a task, refer to Section 4.2.

■ Using user library data: global labels

Use global labels in a user library by selecting them in a program.
For details of selecting global labels in a program, refer to Chapter 5.

■ Using user library data: functions/function blocks

Use functions/function blocks in a user library by selecting a user library for POU type in the Function Block Selection window.
For details of using functions/function blocks, refer to Section 5.4.

■ Using user library data: structures

Use structures in a user library by setting them in each label editor.
For details of using structures, refer to Section 5.6.

13.4.3 Editing user library

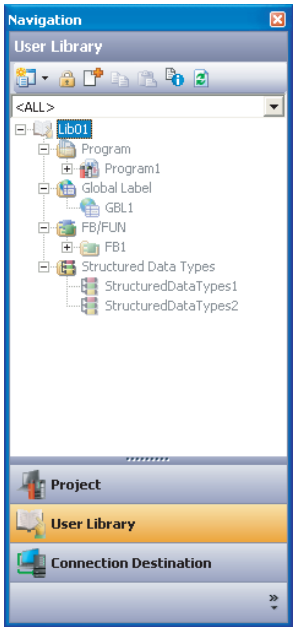
Edit installed user library data.

■ Enabling editing of user library data

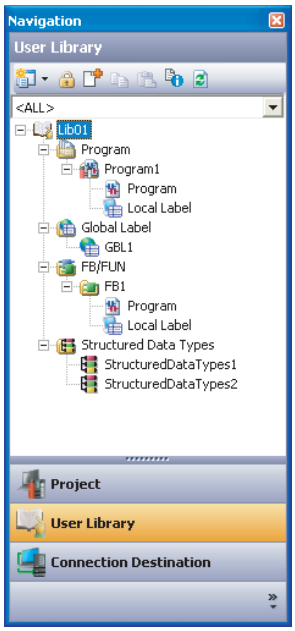
Enable the editing of user library data.
To edit user library data, the library needs to be set in the editing status.

Screen display

<Editing disabled status>



<Editing status>

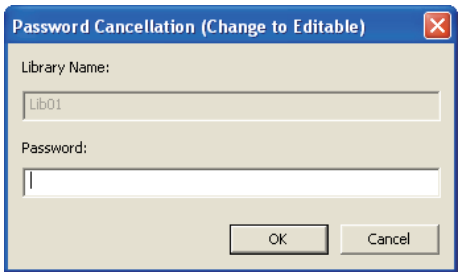


Operating procedure

1. **Select a user library to edit in the User Library view. (Multiple libraries can be selected.)**

2. **Select [Project] ⇒ [Library] ⇒ [Open] ( ).**
   The editing of the user library data is enabled.

● Library password
If the library is protected with a password, the password needs to be entered to open the library for editing.
When the password entry screen is displayed, enter the library password.



Point

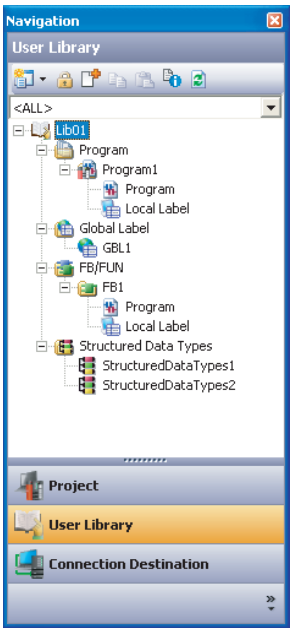
● **Editing status when opening a project**
When a project is opened, all libraries are in the editing disabled status.
(Even if a project is closed with the editing status, it is set in the editing disabled status when reopening the project.)

■ Disabling editing of user library data

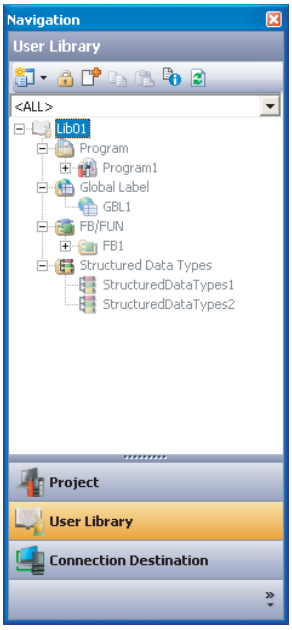
Disable the editing of user library data.

Screen display

<Editing status>



<Editing disabled status>



Operating procedure

1. **Select a user library to edit in the User Library view. (Multiple libraries can be selected.)**

2. **Select [Project] ⇒ [Library] ⇒ [Close] ( ).**
   The editing of the user library data is disabled.

13.4.4 Updating user library

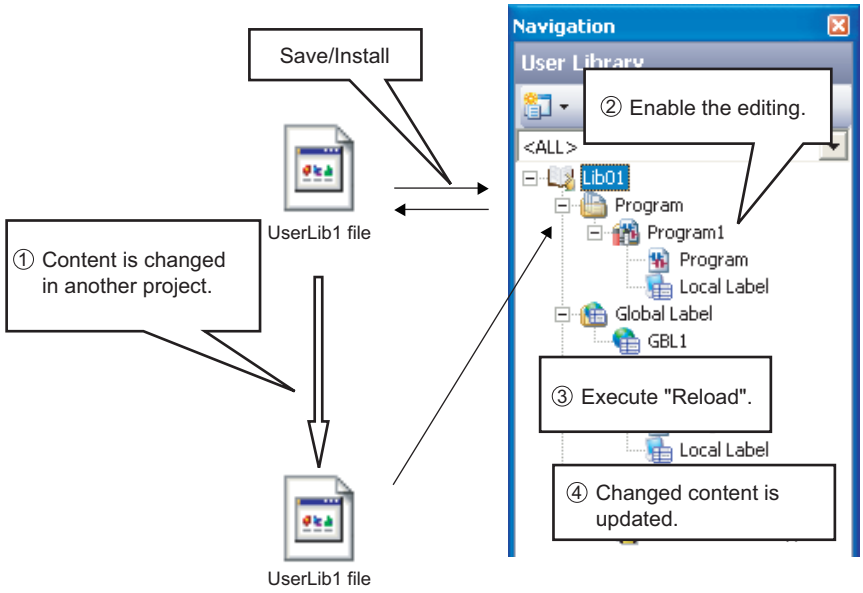
Update data in a user library file.

Operating procedure

1. **Select a library name to be updated in the User Library view. (Multiple libraries can be selected.)**

2. **Select [Project] ⇒ [Library] ⇒ [Reload].**
   The data in the library file is read and the display contents in the User Library view are refreshed.

To apply the library file changes made in another project (① in the figure below) to the current project, the user library needs to be updated (③ and ④ in the figure below).



Point

- **Compilation status of POUs**
  When a user library is updated, all POUs using the updated user library become in the uncompiled status.
- **Editing status**
  - Before using this function, enable the editing of the user library data. (☞ Section 13.4.3)
  - When this function is completed, the editing of the user library data is disabled.

13.4.5 Displaying user library help

Display a help set to a user library.
Specified files created in the following formats can be set as help data.

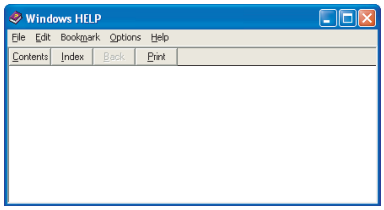
- Windows help file (*.hlp)
- HTML help file (*chm)
- Text file (*txt)

For setting a help, refer to Section 13.3.7.

Screen display

Select [Project] ⇒ [Library] ⇒ [Help].

Windows® help file (*.hlp)



HTML help file (*.chm)

Operating procedure

1. **Select a library name to be displayed as a library help in the User Library view.**

2. **Select [Project] ⇒ [Library] ⇒ [Help].**
   A library help screen is displayed.

14 SETTING OPTIONS

This chapter explains the functions of options for setting screen display format or detailed operations of each function.

14.1 Basic Operations 14-2
14.2 Option Setting List 14-3

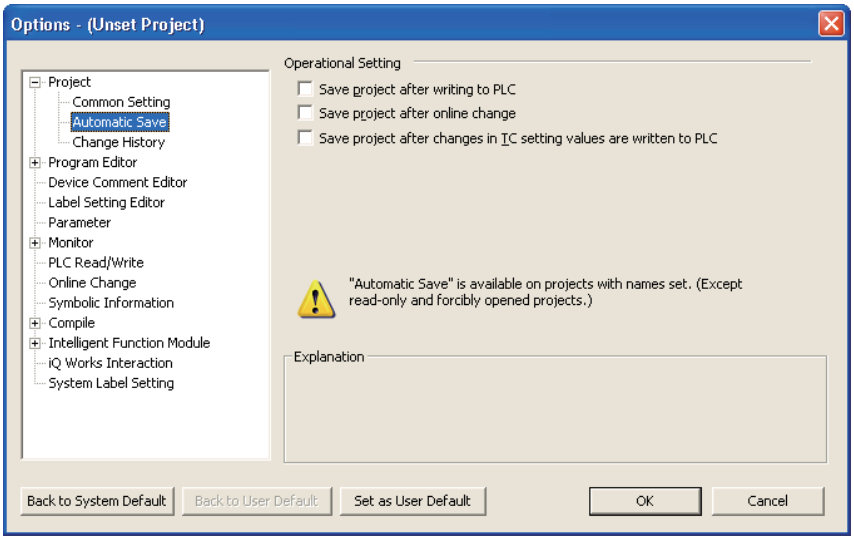
14.1 Basic Operations

Q CPU L CPU FX

This section explains how to set options.

Screen display

Select [Tool] ⇒ [Options].



Operating procedure

- **Set the items on the screen.**

  When the cursor is placed on a setting item, an explanation of the item is displayed on the "Explanation" field.

  Details of the setting items ☞ Section 14.2

Screen button

● Back to System Default

Restores the initial settings.

● Back to User Default

Restores the user default settings.

● Set as User Default

Stores the current settings as the user default and applies them to a new project.

14.2 Option Setting List

Q CPU L CPU FX

The following table shows the option setting items.

Option tree item			Item	Description	Reference
Project			☞ GX Works2 Version 1 Operating Manual (Common)		
Program Editor	Structured Ladder/ FBD/ST	Tool Hint	Tool Hint Display Items	Select items displayed on tool hint.	Section 6.2.8
			Tool Hint Display Format	Select display lines on tool hint.	
	Structured Ladder/ FBD	Label	Display label name/ comment of contact or coil in multiline	Set display lines and characters per line.	Section 8.7
			Display labels and devices	Select whether to display labels and devices which are assigned to the labels, when 'Label' is selected from View Mode. Users can neither edit the displayed devices nor set them to the Find/Replace target.	Section 8.7.2
			Declare new label name	Select whether to display label registration/selection dialog when entering new labels.	Section 8.6.2
		FB/FUN	Wrap instance name for function block	Select whether to wrap function block instance name at the function block width.	Section 8.7
			Specify the number of enable characters for label name/comment	Specify the number of display characters of function or function block label.	
			Automatic input/output labels	Select whether to add input/output label when function block or function is pasted.	Section 8.6.1
			Automatic ENO labels	Select whether to add ENO output label when function block or function is pasted.	
			Pin overwrites	Select whether to overwrite I/O label with a grid line when ruling a grid line over function or function block.	Section 8.3.2
			Double clicking opens header	Select whether a label editor is displayed when function or function block is double clicked.	Section 6.2.9
			Double clicking opens body	Select whether a program editor is displayed when function or function block is double clicked.	
		Guided	Ladder Wrapping	Select whether to wrap ladder. The edited ladder shall be object after changing the setting.	Section 8.10
			Open Structure Ladder/ FBD Editor in guided mode	Set the default at opening structured ladder/FBD editor as guided mode.	
			Allow hotkey repeater	Select whether to display grid line ruling dialog at drawing lines.	
			Enter label names after contacts and coils	Select whether to input label names or devices after entering contacts and coils.	
			Auto Comment Block Width	Set the width of comment to be added in ladder block with grid numbers when adding ladder block.	
	ST		Auto indention	Select whether to use the automatic indent when beginning a new line after entering ST control syntax such as IF or FOR, and when displaying template of inline structured text.	Section 7.1.2
			Instruction/label name prediction	Select whether to display listed label names starting with the input character when a character is input. (Structured text: label name, inline structured text: instruction and label name)	Section 7.1.1
			Tabulator Length	Set tab length. It is not available with inline structured text.	Section 7.1.3
	Ladder/SFC*1		☞ GX Works2 Version 1 Operating Manual (Common)		
	Ladder*1		☞ GX Works2 Version 1 Operating Manual (Simple Project)		
	SFC*1				

Option tree item		Item	Description	Reference
Device Comment Editor		☞ GX Works2 Version 1 Operating Manual (Common)		
Label Setting Editor		Automatic copy and increment when inserting a row	Select whether to copy the texts in the upper row after incrementing it when inserting a row.	Section 5.5.4
		Copy data type/comment items	Select if the data type, comment, and remark shall be object for auto copy.	
		Default Length of String Data Type	Set the default string length for string data type.	Section 5.5.3
Parameter		☞ GX Works2 Version 1 Operating Manual (Common)		
Monitor	Structured Ladder/FBD/ST	Display Format of Monitoring Value	Select whether to display monitored value in Decimal or Hexadecimal.	Section 12.3.1
		Monitor buffer memory and link memory * Only applies to the QCPU, LCPU, FX3U(C)	Select whether to monitor buffer memory and link memory during monitoring. Scan time of PLC will be lengthened depending on the setting.	-
		Significant Characters	Set the number of displayable characters to monitor character-string data.	Section 12.3.2
	Ladder	☞ GX Works2 Version 1 Operating Manual (Simple Project)		
	SFC[*1]			
PLC Read/Write		☞ GX Works2 Version 1 Operating Manual (Common)		
Online Change[*1]		☞ GX Works2 Version 1 Operating Manual (Common)		
Symbolic Information		☞ GX Works2 Version 1 Operating Manual (Common)		
Compile	Basic Setting	Function Block Call[*1]	Enables the followings: calling function block from ladder to ST and from ST to ladder, using inline ST in ladder and reducing steps when using function block. *Value of VAR_IN_OUT type input label always remains equal to the value of output label.	Section 4.4.1
		Program Check	Check when program check is not needed after Build or Online Program Change. It can reduce the compile time depending on the setting.	-
		Operational Setting	Select whether to use the same label name in global label and local label. When the same label is selected, local label will be given priority.	
		Build Cross Reference Information	By creating cross reference information after compiling, time to search cross reference can be reduced. Also able to search cross reference information even before compiling. In this case, the specified Find condition will be used as filtering condition.	
	Output Result	Stop Build	Set the number of error and warning to stop the compile.	Section 10.4
		Disable Warning Codes	Register warning codes to invalidate. The registered warning codes shall not be displayed in output window.	

Option tree item			Item	Description	Reference
Compile	Structured Ladder/ FBD/ST	Compile Condition 1	Use lower-case device names as labels*2	Select whether to use device names typed with lower case as labels. Only the device name outside device range is valid for Inline Structured Text.	Section 10.4
			Function Output Setting	Select whether to connect directly from the objective function output to other input.	
		Compile Condition 2	(D)INT_TO_BOOL_E, (D)WORD_TO_BOOL_E, TIME_TO_BOOL_E	Select whether to generate a code to keep bit type output of objective function block.	
			NOT_E		
			LIMITAION_E, MAXIMUM_E, MINIMUM_E		
			EQ_E, NE_E, GT_E, GE_E, LT_E, LE_E		
			AND_E, OR_E, XOR_E		
			User Defined Function with EN/ENO	Select whether to generate a code which keeps bit type output of the target function. (Codes keeping bit type are generated if output is in bit type array or in structure array, regardless of option setting.)	
			User Defined Function Block with EN/ENO	Select whether to generate a code which keeps bit type output of the target function block. (Codes keeping bit type are generated if output is in bit type array or in structure array, regardless of option setting.)	
		Compile Condition 3	Automatically assign each system device to output of functions that use EN/ENO. *Please refer to appropriate manual if you want to uncheck the box because some programs require caution.	Select whether to assign each system device to output functions of EN/ENO. Only functions enabled. (Function block is disabled. Only checked functions at [Generate Code That Holds the Output of the Following] are enabled when the output is bit type.	
Intelligent Function Module*1			☞ GX Works2 Version 1 Operating Manual (Intelligent Function Module)		
IQ Works Interaction*1			☞ GX Works2 Version 1 Operating Manual (Common)		
System Label Setting*3			Use MELSOFT Navigator Option Information	Checking this option enables use of the option setting of MELSOFT Navigator. The option setting specified in MELSOFT Navigator at the time of opening this project is used.	Section 5.2
			System Label Name Setting	Set how to name system labels. When system labels are entered, system label names are determined based on this setting at the time of project save.	

*1: Not supported by FXCPU.

*2: Not supported by Simple Project.

*3: For FXCPU, this item is supported by FX3G, FX3U, and FX3UC only.

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APPENDIX

Appendix 1 List of Toolbars and Shortcut Keys. App-2

Appendix 1 List of Toolbars and Shortcut Keys

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This section shows the list of toolbars and shortcut keys that can be used in Structured project.

For (Common), (Simple), and (Intelligent) indicated in the Reference column, refer to the following manuals respectively:
(Common).....GX Works2 Version 1 Operating Manual (Common)
(Simple).....GX Works2 Version 1 Operating Manual (Simple Project)
(Intelligent).....GX Works2 Version 1 Operating Manual (Intelligent Function Module)

Appendix 1.1 Common toolbars and shortcut keys

The following explains the toolbars that are available regardless of the editing target and the corresponding shortcut keys.

■ "Standard" toolbar icons

The following table shows the "Standard" toolbar icons and the corresponding shortcut keys.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Ctrl + N	New	Create a new project.	(Common)
	Ctrl + O	Open	Open an existing project.	
	Ctrl + S	Save	Save the project.	
	F1	GX Works2 Help	Display the GX Works2 Help screen.	
-	-	Find Help for GX Works2	Search for help items with an entered keyword on the GX Works2 Help screen.	

■ "Program Common" toolbar icons

The following table shows the "Program Common" toolbar icons and the corresponding shortcut keys.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Ctrl + X	Cut	Cut the selected data.	-
	Ctrl + C	Copy	Copy the selected data.	
	Ctrl + V	Paste	Paste the cut/copied data at the cursor position.	
	Ctrl + Z	Undo	Cancel the previous operation.	Section 6.2.3
	Ctrl + Y	Redo	Perform the operation canceled by [Undo].	
	Ctrl + F	Find Device	Search for a device.	(Common)
	-	Find Instruction	Search for an instruction.	
	Shift + Alt + F7	Find Contact or Coil	Search for a contact or coil corresponding to a specified device.	
	-	Write to PLC	Write data to the programmable controller CPU.	Chapter 11
	-	Read from PLC	Read data from the programmable controller CPU.	
	-	Start Monitoring (All Windows)	Start monitoring all windows being opened.	-
	-	Stop Monitoring (All Windows)	Stop monitoring all windows being opened.	-
	F3	Start Monitoring	Start monitoring the window being operated.	Section 12.1
	Alt + F3	Stop Monitoring	Stop monitoring the window being operated.	
	-	Device/Buffer Memory Batch Monitor	Batch monitor device/buffer memories.	(Common)
	Shift + Enter	Modify Value	For ladder and SFC (Zoom) programs, change the ON/OFF and value of a device/label used in a program.	
	F4	Build	Convert/compile the program being edited.	Section 10.1
	Shift + F4	Online Program Change	Convert/compile a sequence program and write it to the programmable controller CPU.	(Common)
	Shift + Alt + F4	Rebuild All	Compile/convert all programs in the project.	Section 10.2
	-	Start/Stop Simulation	Start/stop simulation.	(Common)

■ "Docking Window" toolbar icons

The following table shows the "Docking Window" toolbar icons.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	-	Navigation Window	Display/hide the Navigation window.	(Common)
	-	Function Block Selection Window	Display/hide the Function Block Selection window.	Section 6.2.1
	-	Output Window	Display/hide the Output window.	Section 10.6
	-	Cross Reference	Display/hide the Cross Reference window.	(Common)
	-	Device List	Display/hide the Device List window.	
	-	Watch 1 to 4	Display/hide the Watch window.	
	-	Intelligent Function Module Monitor	Display/hide the Intelligent Function Module Monitor window.	(Intelligent)
	-	Intelligent Function Module Guidance	Display/hide the Intelligent Function Module Guidance window.	
	-	Find/Replace	Display/hide the Find/Replace window.	(Common)

■ "Intelligent Function Module" toolbar icons

The following table shows the "Intelligent Function Module" toolbar icons.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	-	QD75/LD75 Positioning Module Wave Trace	Execute a wave trace of the QD75/LD75 positioning module.	(Intelligent)
	-	QD75/LD75 Positioning Module Location Trace	Execute a location trace of the QD75/LD75 positioning module.	
	-	Serial Communication Module Circuit Trace	Execute a circuit trace of the serial communication module.	
	-	QD75/LD75 Positioning Module Test Monitor	Execute a positioning monitor of the QD75/LD75 positioning module.	
	-	QD75/LD75 Positioning Module Test Monitor	Execute a positioning test of the QD75/LD75 positioning module.	
	-	Offset/Gain Setting of Temperature Input Module	Execute offset/gain setting of the temperature input module.	
	-	Offset/Gain Setting of Analog Module	Execute offset/gain setting of the analog module.	

■ "Debug Function" toolbar icons

The following table shows the "Debug Function" toolbar icons.

	Shortcut key	Corresponding menu	Description	Reference
	-	Stop	Stop the step execution.	(Common)
	-	Cancel	Cancel the step execution.	
	-	Break Execution	Execute the break execution.	
	-	Step Execution	Execute the step execution.	
	-	Execution Option	Display the "Execution Option" screen of the step execution.	
	-	Set/Cancel Break Point	Set a break point at the cursor position, or cancel the set break point.	
	-	Enable/Disable Break Point	Enable/disable the break point at the cursor position.	
	-	Cancel All Break Points	Cancel all break points.	
	-	Break Point Window	Display the Break Point window.	
	-	Cancel All Break Devices	Cancel all break devices.	
	-	Break Device Window	Display the Break Device window.	
	-	Set/Cancel Skip Range	Set a skip range, or cancel the set skip range.	
	-	Enable/Disable Skip Range	Enable/disable the skip range at the cursor position.	
	-	Cancel All Skip Ranges	Cancel all skip ranges.	
	-	Skip Range Window	Display the Skip Range window.	

■ Other shortcut keys

The following table shows other shortcut keys that are available regardless of the editing target.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
-	F2	Rename	Change the name of the selected data or library in the Navigation window.	(Common)
-	Delete	Delete	Delete the selected data.	
-	Ctrl + Shift + C	Copy	Copy data in the project.	
-	Ctrl + Shift + V	Paste	Paste the copied data to a folder.	
-	Ctrl + Shift + E	Add New Module	Add the intelligent function module data to the project being edited.	
-	Alt + F4	Exit	Close the project being edited and exits GX Works2.	
-	Ctrl + E	Cross Reference	Create the cross reference information.	
-	Ctrl + D	Device List	Display the device usage list.	
-	F11 / Ctrl + .	-	Move to the next cross reference information.	
-	Shift + F11 / Ctrl + Shift + .	-	Move to the previous cross reference information.	
-	F12 / Ctrl + ,	-	Move focus between the Cross Reference window and work windows.	

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
-	Ctrl + F	Find Device	Search for a device/label in the program.	(Common)
-	Ctrl + Shift + F	Find String	Search for a string.	
-	Ctrl + H	Replace Device	Replace a device/label in the program.	
-	Ctrl + Shift + H	Replace String	Replace a string.	
-	Ctrl + Alt + ↓	-	Search for an item in the downward direction.	
-	Ctrl + Alt + ↑	-	Search for an item in the upward direction.	
-	Shift + F3	Start Watching	Start monitoring the current values of registered devices/labels and intelligent function module.	
-	Shift + Alt + F3	Stop Watching	Stop monitoring the current values of registered devices/labels and intelligent function module.	
-	Ctrl + Enter	Register Device Test with Execution Condition	Register the device test with execution condition.	
-	Ctrl + F4	-	Close the window displayed on the uppermost position.	
-	Ctrl + F6	-	Move to the next uppermost window.	

Appendix 1.2 "Navigation Window" toolbar icons

The following table shows the "Navigation Window" toolbar icons.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	-	Add New Data	Add data to the project.	(Common)
	-	Copy	Copy selected data.	
	-	Paste	Paste copied data.	
	-	Property	Display a property of the selected data.	-
	-	Refresh	Update the display content of the Navigation window.	
	-	Project Property	Display a property of the open project.	(Common)
		Expand All Uncompiled Data	Expand all uncompiled data in the tree on the Project view and the User Library view.	
		Collapse All	Collapse all data in the tree on the Project view and the User Library view.	

Appendix 1.3 Toolbar icons and shortcut keys for setting labels

The following explains the toolbar icons and the corresponding shortcut keys used for setting labels.

■ "Label" toolbar icons

The following table shows the "Label" toolbar icons and the corresponding shortcut keys.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Shift + Insert	New Declaration (Before)	Add a row above the cursor position.	Section 5.5.4
	-	New Declaration (After)	Add a row below the cursor position.	
	Shift + Delete	Delete Row	Delete the row at the cursor position.	
	-	Read from CSV File	Read label settings from the CSV file.	Section 5.8
	-	Write to CSV File	Write label settings to the CSV file.	
	-	Confirm Update of System Label Database	Reflect system label information changed in another project on global labels.	Section 5.2
	-	Import System Label	Import system label information and reflect it on global labels.	
	-	Register Device Name of System Label	Register a selected global label as a system label.	
	-	Disable System Label Relation	Disable the relation between a selected global label and a system label.	

■ Other shortcut keys

The following table shows other shortcut keys for setting labels.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
-	Ctrl + A	Select All	Select all rows.	Section 5.5.4
-	Ctrl + +	-	Display all lines of comment and remark of the selected line.	
-	Ctrl + −	-	Display only the first line of comment and remark of the selected line.	

Appendix 1.4 Toolbar icons and shortcut keys for setting device memory

The following explains the toolbar icons and the corresponding shortcut keys for setting device memory.

■ "Device Memory" toolbar icons

The following table shows the "Device Memory" toolbar icons and the corresponding shortcut keys.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	-	Display Mode/Binary	Change display format to binary.	(Common)
	-	Display Mode/Octal	Change display format to octal.	
	-	Display Mode/Decimal	Change display format to decimal.	
	-	Display Mode/ Hexadecimal	Change display format to hexadecimal.	
	-	Display Mode/Float	Change display format to real numbers.	
	-	Display Mode/String	Change display format to string.	
	-	Display Mode/String (ASCII only)	Change display format to ASCII.	
	-	Register/16-bit	Display data in units of words.	
	-	Register/32-bit	Display data in units of double words.	
	-	Register/64-bit	Display data in units of 64 bits.	
	Ctrl + I	Input Device	Enter a device.	
	-	FILL	Set the same value to continuous devices.	
	-	Read Device Memory from PLC	Read data in device memory from a programmable controller CPU.	
	-	Write Device Memory to PLC	Write data in device memory to a programmable controller CPU.	
	-	Read from Excel File	Read data from an Excel file.	
	-	Write to Excel File	Write data to an Excel file.	

■ Other shortcut key

The following table shows other shortcut key for setting device memory.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
-	Insert	Insert Row	Insert a row at the cursor position.	(Common)

Appendix 1.5 Toolbar icons and shortcut keys for verification result

The following table shows the toolbar icons and the corresponding shortcut keys for the verification result.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Alt + ↓	Next Unmatch	Move to the next mismatched data.	(Common)
	Alt + ↑	Previous Unmatch	Move to the previous mismatched data.	
	Alt + Back Space	Return to Result List	Display the <<Verify Result List>>.	
	Ctrl + Delete	Close Detail Result	Close the <<Detail Verify Result>> being displayed.	
	Ctrl + Shift + Delete	Close All Detail Result	Close all <<Detail Verify Result>>.	
	-	Write to CSV File	Write verification result to a CSV file.	

Appendix 1.6 Toolbar icons for executing sampling trace

The following table shows the toolbar icons for executing sampling trace.

Toolbar icon	Shortcut key	Corresponding menu		Description	Reference
	-	Trace Setting		Display the Trace Setting screen.	(Common)
	-	Start Trace		Start sampling trace. To start sampling trace, the trace ready signal (SM800) must be ON.	
	-	Stop Trace		Stop sampling trace.	
	-	Display Trace Buffer Condition		Display the Trace Data Storage Status screen.	
	-	Monitor Status		Display the current sampling trace status	-
	-		Execution Failed	Indicate the sampling trace stop status, or the status sampling trace has not started.	
	-		Before Trigger	Indicate the status sampling trace is executed but a trigger is not generated.	
	-		After Trigger	Indicate the status sampling trace is executed and a trigger is generated.	
	-		Stop	Indicate the status sampling trace is interrupted.	
	-		Completion	Indicate the status sampling trace has ended normally by acquiring trace data up to the specified total number of samplings after generation of a trigger.	
	-		Error	Indicate the status a sampling trace error occurred during sampling trace.	
	-	Buffer Status		Displayed when the trace data have been acquired up to the specified total number of samplings.	
	-	Trigger Occurrence		Displayed when a trigger is generated during sampling trace.	

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	-	Zoom Out Timing Chart	Zoom the scale of timing chart	(Common)
	-	Zoom In Timing Chart		
	-	Zoom Out Trend Graph	Zoom the scale of trend graph	
	-	Zoom In Trend Graph		
	-	Switch Chart/Detail	Switch the trace result display on the Sampling Trace screen between the timing chart (graph) and the detailed data (value).	

Appendix 1.7 Toolbar icons and shortcut keys for program editors

The following explains the toolbar icons and the corresponding shortcut keys for program editors.

■ "Ladder" toolbar icons and shortcut keys

The following table shows the toolbar icons and the corresponding shortcut keys for the ladder editor.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	F5	Open Contact	Insert an open contact at the cursor position.	(Simple)
	Shift + F5	Open Branch	Insert an open contact branch at the cursor position.	
	F6	Close Contact	Insert a closed contact at the cursor position.	
	Shift + F6	Close Branch	Insert a closed contact branch at the cursor position.	
	F7	Coil	Insert a coil at the cursor position.	
	F8	Application Instruction	Insert an application instruction at the cursor position.	
	F9	Horizontal Line	Insert a horizontal line at the cursor position.	
	Shift + F9	Vertical Line	Insert a vertical line at the cursor position.	
	Ctrl + F9	Delete Horizontal Line	Delete the horizontal line at the cursor position.	
	Ctrl + F10	Delete Vertical Line	Delete the vertical line at the cursor position.	
	Shift + F7	Rising Pulse	Insert a rising pulse at the cursor position.	
	Shift + F8	Falling Pulse	Insert a falling pulse at the cursor position.	
	Alt + F7	Rising Pulse Branch	Insert a rising pulse branch at the cursor position.	
	Alt + F8	Falling Pulse Branch	Insert a falling pulse branch at the cursor position.	
	Shift + Alt + F5	Rising Pulse Close	Insert a rising pulse close at the cursor position.	
	Shift + Alt + F6	Falling Pulse Close	Insert a falling pulse close at the cursor position.	

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Shift + Alt + F7	Rising Pulse Close Branch	Insert a rising pulse close branch at the cursor position.	(Simple)
	Shift + Alt + F6	Falling Pulse Close Branch	Insert a falling pulse close branch at the cursor position.	
	Alt + F5	Operation Result Rising Pulse	Insert an operation result rising pulse at the cursor position.	
	Ctrl + Alt + F5	Operation Result Falling Pulse	Insert an operation result falling pulse at the cursor position.	
	Ctrl + Alt + F10	Invert Operation Results	Insert an operation result inversion at the cursor position.	
	F10	Edit Line	Input a line at the cursor position.	
	Alt + F9	Delete Line	Delete the line at the cursor position.	
	Ctrl + B	Insert Inline Structured Text Box	Insert an inline structured text box.	
	-	Device Comment	Edit device comments.	
	-	Statement	Edit statements.	
	-	Note	Edit notes.	
	-	Statement/Note Batch Edit	Batch edit the statements/notes in the program.	
	Ctrl + L	Line Statement List	Display the list of line statements used in the program.	
	Ctrl + Alt + F1	Display Template	Insert a template corresponds to the instruction/function/control syntax.	Section 7.1.4
	Alt + ←	Mark Template (Left)	Set an argument of the template in the selected status from the left by selecting the menu each time.	
	Alt + →	Mark Template (Right)	Set an argument of the template in the selected status from the right by selecting the menu each time.	
	Shift + F2	Read Mode	Switch the mode of the open window to "Read Mode".	(Simple)
	F2	Write Mode	Switch the mode of the open window to "Write Mode".	
	F3	Monitor Mode	Switch the mode of the open window to "Monitor Mode" during monitoring.	
	Shift + F3	Monitor (Write Mode)	Switch the mode of the open window to "Monitor (Write Mode)" during monitoring.	
	Ctrl + Alt + F6	Device Display	Display devices assigned by compilation.	
	-	Zoom	Change the display magnification ratio of the ladder.	
-	Shift + Insert	Insert Row	Insert a row at the cursor position.	
-	Shift + Delete	Delete Row	Delete the row at the cursor position.	
-	Ctrl + Insert	Insert Column	Insert a column at the cursor position.	
-	Ctrl + Delete	Delete Column	Delete the column at the cursor position.	
-	Ctrl + Shift + →	Connect Line to Right-Side Symbol	Connect a horizontal line to the ladder symbol at the right of the cursor position.	
-	Ctrl + Shift + ←	Connect Line to Left-Side Symbol	Connect a horizontal line to the ladder symbol at the left of the cursor position.	
-	Ctrl + →	Enter/Delete HLine Rightward	Enter/delete a line at the right of the cursor position.	
-	Ctrl + ←	Enter/Delete HLine Leftward	Enter/delete a line at the left of the cursor position.	
-	Ctrl + ↓	Enter/Delete VLine Downward	Enter/delete a line at the downward of the cursor position.	

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
-	Ctrl + ↑	Enter/Delete VLine Upward	Enter/delete a line at the upward of the cursor position.	
-	Ctrl + /	Switch Open/Close Contact	Switch a open contact to closed contact, and vice versa.	
-	Ctrl + :	Switch Statement/Note Type	Change the type of a statement/note.	
-	Ctrl + Alt + Enter	Instruction Partial Edit	Open the Enter Symbol screen in which the first argument is in the selected status.	
-	Alt + → / ←	-	Select a device/label on the Enter Symbol screen. Switches the device/label to be selected using the → / ← button.	
-	Alt + ↑ / ↓	-	Increment/decrement a device/label on the Enter Symbol screen.	
-	Ctrl + Space	-	Display options of instruction/label on the Enter Symbol screen.	
-	Ctrl + ↑ / ↓ / → / ←	-	Move the cursor on the editing screen while the Enter Symbol screen is displayed.	
-	Ctrl + G	Jump	Display the specified row.	
-	Ctrl + Alt + PgDown	Jump to Next Ladder Block Start	Jump a cursor from the current position to the start of the next ladder block.	
-	Ctrl + Alt + PgUp	Jump to Previous Ladder Block Start	Jump a cursor from the current position to the start of the previous ladder block.	(Simple)
-	Ctrl + F5	Comment	Display device comments.	
-	Ctrl + F7	Statement	Display statements.	
-	Ctrl + F8	Note	Display notes.	
-	Ctrl + −	Non-Display Ladder Block	Hide a ladder block.	
-	Ctrl + +	Display Ladder Block	Display a hidden ladder block.	
-	Ctrl + turn mouse scroll wheel upward	Bigger	Change the display size of text larger on the editing screen.	
-	Ctrl + turn mouse scroll wheel downward	Smaller	Change the display size of text smaller on the editing screen.	
-	Ctrl + Shift + Enter	Tile FB Horizontally	Tile the ladder editor and the function block program editor horizontally.	
-	Ctrl + R	Back to Zoom SFC Block	Open the SFC diagram corresponds to the program on the Zoom editor window.	
-	Shift + Alt + ↑ / ↓ / → / ←	Moves up/down/left/right	Move a cursor toward up/down/left/right of the SFC diagram.	
-	Ctrl + F1	Open Instruction Help	Display the Instruction Help screen.	
-	Space	-	Display the Find screen.	
-	F1	Instruction Help	Display details of instructions.	(Common)
-	Ctrl + Shift + =	-	Enter an assignment operator (:=) when editing the inline structured text program.	Section 7.1.1

■ "ST" toolbar icons and shortcut keys

The following table shows the toolbar icons and the corresponding shortcut keys for the ST editor.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	F2	List Operands	Display the Label Registration/Selection screen.	Section 6.2.2
	Ctrl + Alt + F1	Display Template	Insert a template corresponds to the instruction/function/control syntax.	Section 7.1.4
	Ctrl + Alt + ←	Mark Template (Left)	Set an argument of the template in the selected status from the left by selecting the menu each time.	
	Ctrl + Alt + →	Mark Template (Right)	Set an argument of the template in the selected status from the right by selecting the menu each time.	
	Ctrl + F7	Toggle Bookmark	Set a bookmark at the cursor line. If a bookmark has already been set, delete the set bookmark.	Section 9.1.2
	-	Bookmark List	Jump to the specified bookmark from the bookmark list.	
	F7	Next Bookmark	Display the next bookmark position.	
	Shift + F7	Previous Bookmark	Display the previous bookmark position.	
	Ctrl + Shift + F7	Delete All Bookmarks	Delete all bookmarks.	
	Ctrl + Num + *1	Increase Zoom	Zoom in the screen one level.	Section 6.2.4
	Ctrl + Num − *1	Decrease Zoom	Zoom out the screen one level.	
-	Ctrl + G	Jump	Jump to the specified line.	Section 9.1.1
-	Shift + F2	Zoom Header/Body Header	Open the label setting screen of the selected POU.	-
-	Ctrl + Insert	Copy	Copy the selected data.	-
-	Shift + Delete	Cut	Cut the selected data.	-
-	Shift + Insert	Paste	Paste the cut/copied data at the cursor position.	-
-	F1	Instruction Help	Display details of instructions.	(Common)
-	Ctrl + Shift + =	-	Enter an assignment operator (:=) when editing the inline structured text program.	Section 7.1.1

*1: 'Num' indicates keys in the numeric keypad.

■ "Structured Ladder/FBD" toolbar icons and shortcut keys

The following table shows the toolbar icons and the corresponding shortcut keys for the structured ladder/FBD editor.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Ctrl + Q	Select Mode	Change the input format for positioning contacts/coils.	Section 8.4
	Ctrl + Shift + G	Guided Mode/Guided Editing	Change the input format for entry with keyboard.	Section 8.10
	Ctrl + T	Interconnect Mode	Change the input mode for drawing lines.	Section 8.3.2
	Alt + Shift + A	Guided Mode/Auto Comment	Add a comment entry field at the start of the ladder block added in Guided editing.	Section 8.10.9
	Ctrl + W	Insert Row	Insert a row in the ladder being edited.	Section 8.3.6
	Ctrl + U	Insert Column	Insert a column in the ladder being edited.	
	Ctrl + Alt + B	New Ladder Block Before	Insert a new ladder block in front of the ladder block being edited.	Section 8.8
	Ctrl + Alt + A	New Ladder Block After	Insert a new ladder block in back of the ladder block being edited.	
	-	Input Instruction	Display the Input Instruction screen.	Section 8.2.2
	-	Left Power Rail	Display/hide the left power rail.	Section 8.8.7
	1	Open Contact	Insert an open contact at the cursor position.	Section 8.2.1
	2	Close Contact	Insert a closed contact at the cursor position.	
	3	Open Branch	Insert an open contact branch at the cursor position.	
	4	Close Branch	Insert a closed contact branch at the cursor position.	
	5	Vertical Line Segment	Insert a vertical line at the cursor position.	
	6	Horizontal Line Segment	Insert a horizontal line at the cursor position.	
	7	Coil	Insert a coil at the cursor position.	
	8	Function Block Selection Window	Display the Function Block Selection window.	
	9	Input Label	Insert an input variable at the cursor position.	
	0	Output Label	Insert an output variable at the cursor position.	
	-	Rising Pulse	Insert a rising pulse at the cursor position.	
	-	Falling Pulse	Insert a falling pulse at the cursor position.	
	-	Rising Pulse Close	Insert a rising pulse close at the cursor position.	
	-	Falling Pulse Close	Insert a falling pulse close at the cursor position.	
	Ctrl + J	Jump	Insert a jump at the cursor position.	
	Ctrl + R	Return	Insert a return at the cursor position.	
	Ctrl + M	Comment	Insert a comment entry field.	
	Ctrl + Shift + L	Ladder Block Label	Display the Ladder Block screen.	
	F2	List Operands	Display the Label Registration/Selection screen.	Section 6.2.2

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	+	Increment Pins	Increment the number of arguments of functions and function blocks.	Section 8.6.3
	−	Delete Pins	Delete the number of arguments of functions and function blocks.	
	Ctrl + Num + *1	Increase Zoom	Zoom in the screen one level.	Section 6.2.4
	Ctrl + Num − *1	Decrease Zoom	Zoom out the screen one level.	
-	Alt + ↑ / ↓	-	Narrow and widen the width of ladder block in the guided mode.	-
-	Ctrl + Alt + S	Signal Configuration/ Configure	Set the type of contact and coil.	Section 8.5
-	Ctrl + Alt + C	Signal Configuration/ Toggle	Change the type of contact and coil in the order shown below: • Contact: Open Contact → Close Contact • Coil: Normal → Negation → Set → Reset	
-	Ctrl + G	Jump	Jump to the specified ladder block number.	Section 9.2.1
-	Ctrl + Shift + M	Change Label-Device-Address Mode	Switch the display format in order (label, device address).	Section 8.7
-	Ctrl + Shift + K	Change Label-Comment Mode	Switch the display between label and comment.	
-	Shift + F2	Zoom Header/Body/ Header	Open the label setting screen for the selected POU.	Section 6.2.9
-	Ctrl + Insert	Copy	Copy the selected data.	-
-	Shift + Delete	Cut	Cut the selected data.	-
-	Shift + Insert	Paste	Paste the cut/copied data at the cursor position.	-
-	Ctrl + B	Auto Connect	Connect the start and end points to draw a line.	Section 8.3.2
-	Insert	Guided Mode /Overwrite, Insert Mode	Switch the input mode between Overwrite/Insert in the guided mode.	Section 8.10
-	Ctrl + L	Guided Mode/Line Mode	Change the input mode for drawing lines in Guided editing.	
-	F1	Instruction Help	Display details of instructions.	(Common)

*1: 'Num' indicates keys in the numeric keypad.

■ "SFC" toolbar icons and shortcut keys

The following table shows the toolbar icons and the corresponding shortcut keys for the SFC editor.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	F5	[STEP] New Step	Insert at the cursor position.	(Simple)
	F6	[B] Block Start Step (with END check)	Insert at the cursor position.	
	Shift + F6	[BS] Block Start Step (without END check)	Insert at the cursor position.	
	F8	[JUMP] Jump	Insert at the cursor position.	
	F7	[END] END Step	Insert at the cursor position.	
	Shift + F5	[DUMMY] Dummy Step	Insert at the cursor position.	
	F5	[TR] Transition	Insert at the cursor position.	
	F6	[--D] Selection Divergence	Insert a selection divergence.	
	F7	[==D] Simultaneous Divergence	Insert a simultaneous divergence.	
	F8	[--C] Selection Convergence	Insert a selection convergence.	
	F9	[==C] Simultaneous Convergence	Insert a simultaneous convergence.	
	Shift + F9	[|] Vertical Line	Insert a vertical line.	
	Ctrl + 1	No Attribute	Set the step attribute to no attribute.	
	Ctrl + 2	Stored Coil	Set the step attribute to Stored Coil.	
	Ctrl + 3	Stored Operation (without Transition Check)	Set the step attribute to Stored Operation (SE).	
	Ctrl + 4	Stored Operation (with Transition Check)	Set the step attribute to Stored Operation (ST).	
	Ctrl + 5	Reset	Reset the step attribute.	
	Alt + F5	Vertical Line (Draw Line)	Insert at the cursor position.	
	Alt + F7	Selection Divergence (Draw Line)	Insert at the cursor position.	
	Alt + F8	Simultaneous Divergence (Draw Line)	Insert at the cursor position.	
	Alt + F9	Selection Convergence (Draw Line)	Insert at the cursor position.	
	Alt + F10	Simultaneous Convergence (Draw Line)	Insert at the cursor position.	
	Ctrl + F9	Delete Line	Delete a line at the cursor position.	
	-	SFC Step/Transition Comment	Edit the SFC step/transition comments.	
	-	Sort SFC Step No.	Sort the SFC block step numbers.	
	-	SFC All Block Batch Monitoring	Batch monitor all blocks in the SFC program.	

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	-	SFC Auto Scroll	Scroll the screen to display active steps automatically when they are out of the screen during monitoring.	(Simple)
	Shift + F2	Read Mode	Switch the mode of the open window to "Read Mode".	
	F2	Write Mode	Switch the mode of the open window to "Write Mode".	
	F3	Monitor Mode	Switch the mode of the open window to "Monitor Mode" during monitoring.	
	Shift + F3	Monitor (Write Mode)	Switch the mode of the open window to "Monitor (Write Mode)" during monitoring.	
	-	Zoom	Change the display magnification ratio of the SFC diagram.	
-	Shift + Insert	Insert Row	Insert a row at the cursor position.	
-	Shift + Delete	Delete Row	Delete a row at the cursor position.	
-	Ctrl + Insert	Insert Column	Insert a column at the cursor position.	
-	Ctrl + Delete	Delete Column	Delete a column at the cursor position.	
-	Ctrl + G	Jump	Move a cursor to the SFC step number/ transition number in the specified block.	
-	Ctrl + M	Find Jump Step	Move a cursor to the step of the jump source.	
-	Numeric key	-	Move a cursor to the SFC step number/ transition number.	
-	Ctrl + F5	SFC Step/Transition Comment	Display the SFC step/transition comments.	
-	Ctrl + L / Ctrl + double-click	Open Zoom/Start Destination Block	Display the Zoom editor window or the start destination block.	
-	Space	-	Display the start destination block.	
-	Ctrl + R	Back to Start SFC Block	Display the start source block.	
-	Ctrl + Alt + F8	Program Display	Display programs on the SFC diagram when editing in MELSAP-L.	

■ SFC block list shortcut keys

The following table shows the shortcut keys for the SFC block list.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
-	Ctrl + G	Jump	Jump to the specified block number/data name.	(Simple)
-	Numeric key	-	Jump to the selected block number.	
-	Ctrl + F5	SFC Block List Comment	Display comments of the SFC block list.	

■ Other shortcut keys

The following table shows other shortcut keys for program editors.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
-	↑ / ↓ / → / ←	-	Move the cursor in the arrow direction.	-
-	PgUp	-	Scroll up the screen.	
-	PgDown	-	Scroll down the screen.	
-	Ctrl + PgUp	-	Scroll the screen to the left.	
-	Ctrl + PgDown	-	Scroll the screen to the right.	
-	Home	-	Move the cursor to its leftmost position in the row.	
-	End	-	Move the cursor to its rightmost position in the row.	
-	Ctrl + Home	-	Move the cursor to the start of the program.	
-	Ctrl + End	-	Move the cursor to the end of the program.	
-	Shift + ↑ / ↓ / → / ←	-	Set a range.	
-	Ctrl + Shift + Home	-	Select the range from the current position up to the start of the program.	
-	Ctrl + Shift + End	-	Select the range from the current position down to the end of the program.	
-	Delete	-	Delete the selected target.	

Appendix 1.8 Toolbar icons and shortcut keys for I/O system setting function

The following table shows the toolbar icons and the corresponding shortcut keys for the I/O system setting function.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Ctrl + N	New	Create a new I/O system setting.	(Common)
	Ctrl + O	Open	Open an existing I/O system setting.	
	Ctrl + S	Save	Save the I/O system setting.	
	Ctrl + X	Cut	Cut the selected data.	
	Ctrl + C	Copy	Copy the selected data.	
	Ctrl + V	Paste	Paste the cut/copied data at the cursor position.	
	-	Execute I/O System Setting	Execute the I/O system setting function and starts simulation.	
	-	Disable I/O System Setting	Disable the execution of the I/O system setting function.	
	-	Start Monitoring	Start monitoring the I/O System Setting screen.	
	-	Stop Monitoring	Stop monitoring the I/O System Setting screen.	
-	Alt + F4	Exit I/O System Settings	Exit the I/O system setting.	

Appendix 1.9 Shortcut keys for operating intelligent function module

The following explains the toolbar icons and the corresponding shortcut keys for editing intelligent function module data.

■ Toolbar icons for positioning monitor function

The following table shows the toolbar icons for the positioning monitor function.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	-	-	Monitor the operating status of positioning module.	(Intelligent)
	-	-	Monitor the start history.	
	-	-	Monitor the error history.	
	-	-	Monitor the warning history.	
	F3	-	Start the positioning monitor.	
	Alt + F3	-	Stop the positioning monitor.	

■ Toolbar icons and shortcut keys for editing predefined protocol support function data

The following table shows the toolbar icons and the corresponding shortcut keys for editing predefined protocol support function data.

Toolbar icon	Shortcut key	Corresponding menu	Description	Reference
	Ctrl + N	New	Create a new protocol setting .	(Intelligent)
	Ctrl + O	Open	Open an existing protocol setting .	
	Ctrl + S	Save	Save the protocol information.	
	Ctrl + C	Copy	Copy the selected data.	
	Ctrl + V	Paste	Paste the cut/copied data at the cursor position.	
	-	Print	Print the protocol information.	
	-	Write to Module	Write data to a module.	
	-	Read from Module	Read data from a module.	

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GX Works2 Version1
Operating Manual
(Structured Project)

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